

INVESTIGATIONS OF CONTROLLED KOLOB  
RESERVOIR RELEASES DURING  
\_\_\_\_\_  
SEPTEMBER 8-17, 1993  
AT ZION NATIONAL PARK, UTAH

Nancy F. Stevens and William R. Hansen

Technical Report NPS/NRWRD/NRTR-97/108

NATIONAL PARK SERVICE  
WATER RESOURCES DIVISION  
FORT COLLINS, COLORADO  
RESOURCE ROOM PROPERTY



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United States Department of the Interior  
National Park Service



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## EXECUTIVE SUMMARY

The National Park Service, in conjunction with the State of Utah and the Washington County Water Conservancy District, cooperatively implemented a study to collect streamflow data in Kolob Creek in Zion National Park during controlled releases from Kolob Reservoir on September 8-17, 1993. The study was designed to investigate the reliability of the existing flume on Kolob Reservoir and determine the quantity and travel time of controlled reservoir releases reaching the confluence of Kolob Creek and the North Fork of the Virgin River.

On September 4, at 0800, the Water Conservancy District started releasing 5 cfs from Kolob Reservoir. Kolob Creek was dry until September 7 when flow reached the study site at 0245, about 3 days later. The peak associated with the 5 cfs release reached the study site at 1945 on September 8, about 4.5 days later. On September 17, at 1600, reservoir releases were reduced to 1 cfs, and flow ceased at the study site on September 18, at 1045, about 1 day later.

Mean daily flows at the Kolob Reservoir flume typically exceeded planned controlled releases by 4.5% to 9%. Data indicate that the 4-ft Parshall flume below Kolob Reservoir was within acceptable levels of accuracy (Olds pers. com. 1993). Difference in flow between Kolob Reservoir and the study site ranged from 2.2 to 10 cfs and averaged 5 cfs during the study period. The percentage of the controlled reservoir releases that did not reach the study site ranged from 12% to 78% and averaged 29.5%. The largest peak occurred during the 10 cfs reservoir release on September 8, at 1945, when discharge increased from 0.9 cfs to 6 cfs in 15 min., an increase of 5.1 cfs. During other incremental reservoir releases a 2.0 cfs increase was common for most peaks. Channel storage probably affected the timing and magnitude of each peak and travel times of controlled reservoir releases. Losses of 7.7 to 17.9 ac-ft per day occurred at the study site, except on September 17-18, when Kolob Creek continued to flow after controlled reservoir releases were reduced to 1 cfs. Cumulative losses for the September 8-17 period were 158.3 ac-ft, or an average of 5.3 cfs per day.



## INTRODUCTION

The National Park Service (NPS) has been negotiating with the State of Utah since 1988 to quantify federal reserved water rights claimed for Zion National Park in the Virgin River Adjudication. In 1993, the NPS expressed concerns during negotiations about the impacts Kolob Reservoir operations might have on NPS water rights and water-related resources in Kolob Creek and the North Fork of the Virgin River. Kolob Reservoir was constructed in 1957 and has altered natural stream flows in Zion (Utah Division of Water Rights 1957-1994). Altered flow regimes could change physical characteristics (e.g., channel morphology, temperature) in Kolob Creek and the North Fork, thereby affecting flow-dependent vegetation and fish and insect communities.

To address these concerns the NPS designed a study, in cooperation with Utah and the Washington County Water Conservancy District, to collect streamflow data in Kolob Creek during controlled releases from Kolob Reservoir. During September 8-17, 1993, the Water Rights Branch of the NPS, in cooperation with the Utah Division of Water Rights, conducted measurements on the reservoir flume and at the mouth of Kolob Creek during controlled releases. The objectives of the study were to (1) determine the reliability of the existing flume below the Kolob Reservoir outlet, and (2) determine the quantity and travel time of controlled reservoir releases reaching the confluence of Kolob Creek and the North Fork.

## METHODS

### *Site Selection and Equipment Installation*

Kolob Reservoir is located 9.4 mi upstream from the study site (Fig. 1). Water was released from the reservoir through a 30- by 30-inch concrete conduit. Releases were measured using a 4-ft Parshall flume located just downstream from the conduit. The study site was located near campsite 6 on Kolob Creek, immediately upstream from the confluence of Kolob Creek and the North Fork (Fig. 2). We accessed the study site by hiking down the upper North Fork.



Figure 1.--Schematic showing locations of Kolob Reservoir and Creek, study site, and USGS gages.

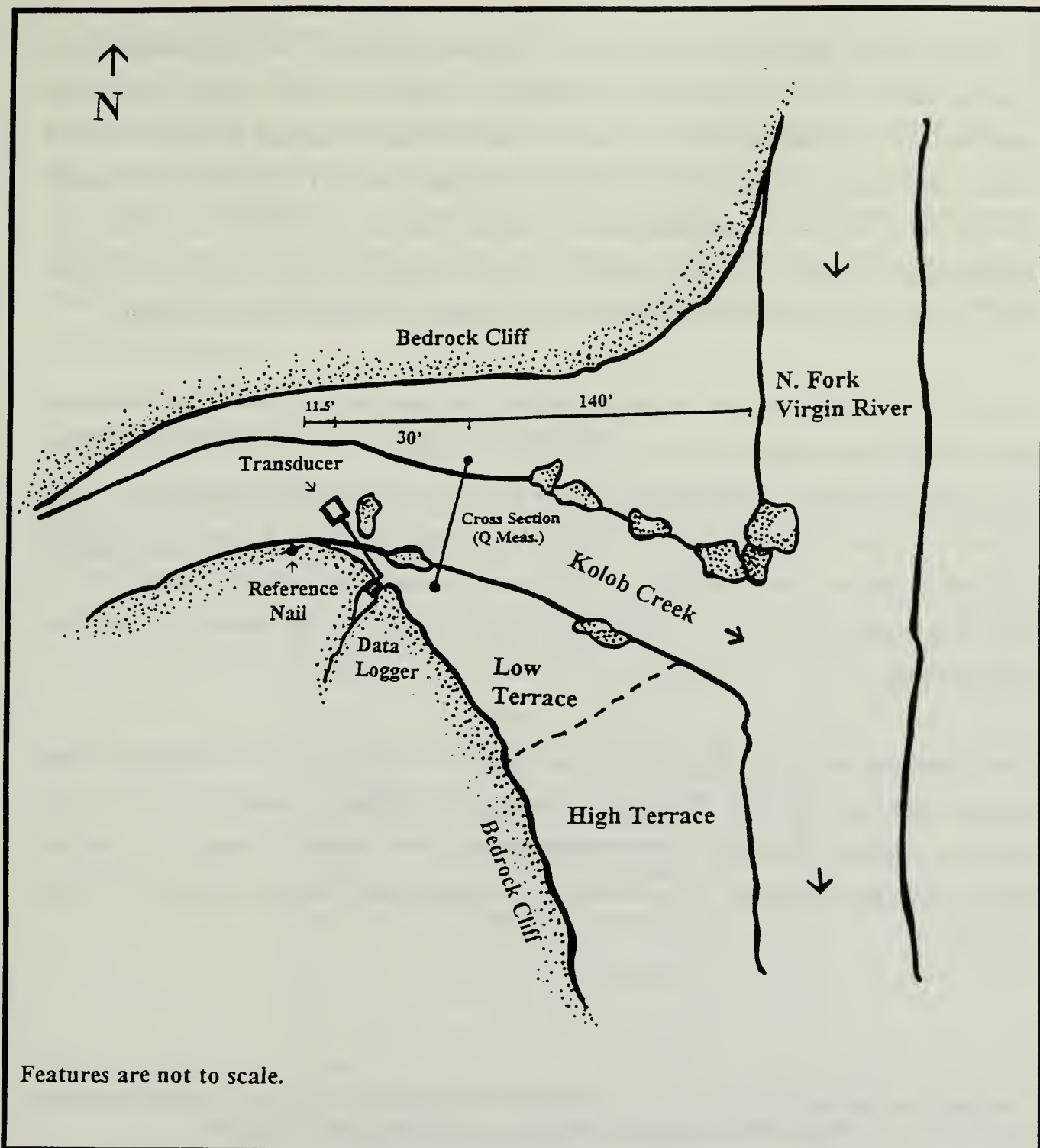


Figure. 2--Study site at Kolob Creek, Zion National Park



A Telog 2109 data logger and a Stevens recorder<sup>1</sup> (Leupold and Stevens, Inc.) were installed at the reservoir flume by the Utah Division of Water Rights on August 26, 1993, to measure stage<sup>2</sup>. They were removed on September 23, 1993. Prior to the release of water for the study, the Utah Division of Water Rights inspected the condition of the flume and confirmed that the Parshall flume was properly installed and operating within acceptable levels of accuracy (Olds pers. com. 1993). The Virgin River Commissioner operated the reservoir outlet and provided controlled reservoir releases during the study, as agreed to by the Water Conservancy District. Stage was recorded in 20-min. intervals.

On July 28, 1993, NPS personnel installed an Omnidata 800 (Omnidata International, Inc.) data logger and a 2.5 psi Druck pressure transducer on Kolob Creek to measure stage. The data logger was hidden in a large rock fracture upstream from the cross section used for discharge measurements. The pressure transducer was placed about 30 ft upstream of the study site and 14 ft from the bedrock cliff in a uniform section of the stream (Fig. 2). The pressure transducer and cable were protected by 7/8-inch flexible sprinkler pipe and a bell housing, which was secured in the channel with rebar and parachute cord.

The channel was dry on July 28 when the pressure transducer was installed. We calibrated the data logger using a 5-gal water bag. The pressure transducer was calibrated for heads of 0.5 and 1.0 ft to produce a calibration equation to convert pressure readings from millivolts to stage (ft). The data logger and pressure transducer were removed on November 3, 1993. Stage was recorded in 15-min. intervals.

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<sup>1</sup>The use of trade and company names is for the benefit of the reader, such use does not constitute an official endorsement or approval of any services or products used by the National Park Service, Water Rights Branch, for this study.

<sup>2</sup>Stage refers to surface water elevation above an arbitrary datum.



A temporary stage reference (nail) was installed in a crack in the bedrock cliff upstream from the transducer (Fig. 2). Stage measurements were made by measuring the vertical distance from the reference nail down to the water surface and were recorded as negative numbers to hundredths of a foot. Stage readings stored in the data logger were compared to field-measured stages before and after each discharge measurement to ensure accuracy of recorded data. The calibration equation was continually monitored and corrected as necessary to ensure a consistent relation with stage readings. Two adjustments to the calibration equation were required during the sampling period to compensate for channel changes.

### *Controlled Reservoir Releases and Sampling Procedures*

Between September 4 and 17, 1993, the Water Conservancy District provided controlled reservoir releases; dates, times, and flow rates are shown in Table 1.

Date	Start time	Flow rate (cfs) <sup>3</sup>
Sep 4	0800	Begin 5
Sep 8	0800	Increase to 10
Sep 10	1600	Increase to 15
Sep 11	1600	Increase to 20
Sep 14	1600	Increase to 25
Sep 15	1600	Increase to 30
Sep 16	1600	Increase to 35
Sep 17	1600	Decrease to 1

Table 1.-- Kolob Reservoir releases for September 4-17, 1993.

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<sup>3</sup> The Utah Division of Water Rights (Olds pers. com. 1993) confirmed that no diversions for irrigation occurred below Kolob Reservoir during the study period.

Discharge measurements were made at a cross section located about 30 ft downstream from the pressure transducer on a uniform and straight section of channel (Fig. 2). The channel bed consisted of cobbles, gravel, and interbedded sand. Although controlled reservoir releases began on September 4, NPS personnel did not begin taking discharge measurements until September 8 because we expected flows at the study site to be delayed due to travel time and channel storage. The last discharge measurement was taken on the morning of September 17.

Discharge measurements were taken daily at 0800, 1100, 1400, and 1700 to develop a discharge rating curve and table for flows between 1 and 35 cfs (Appendix A). A total of 33 measurements were taken between September 8 and 17.

We used the USGS mid-section method (Buchanan and Sommers, 1984) to measure and compute discharge with pygmy or Price AA current meters. Current meters were cleaned and spin tested each day, as described in Smoot and Novak (1977), to ensure the equipment was operating correctly. Information about flow conditions, channel changes, and recreational use was recorded in field notes.

### *Analysis*

Twenty-minute stage readings from the data logger at the Kolob Reservoir flume were converted to discharge values using equation 1 (Bureau of Reclamation, 1967) for a 4-ft Parshall flume. Mean daily discharge (Q) was computed from 20-min. discharges and is shown in Appendix B.

$$Q = 4WH_a^{1.522}W^{0.026} \quad (1)$$

where:

Q = discharge (cfs)

W = width of flume (ft)

H<sub>a</sub> = upper head (stage)

Fifteen-minute stage readings from the data logger at the study site were converted into positive values, and then discharge was determined using equation 2 (Kennedy 1984; Appendix C). A rating curve was developed from the discharge measurements taken at Kolob Creek and is shown in Appendix B. Curve fitting was used to determine the coefficients for the rating equation.

$$Q = 64.57(G-4.1)^{1.59} \quad (2)$$

where:

Q = discharge (cfs)

G = stage (ft)

Mean daily discharge (Q) was calculated from 15-min. discharges and is shown in Appendix C. The rating table is shown in Appendix D.

Difference in flow was determined by subtracting the discharge at the study site from the controlled reservoir release. The percentage of the controlled reservoir release absent from the study site was determined by equation 3.

$$\frac{Q_{(CRR)} - Q_{(Kolob\ Ck)}}{Q_{(CRR)}} * 100 \quad (3)$$

where:

$Q_{(CRR)}$  = controlled reservoir release (cfs)

$Q_{(Kolob\ Ck)}$  = measured discharge at the study site (cfs)

Peaks and travel time were determined from 15-min. discharge values for the study site. A peak was defined as the largest increase in discharge recorded at the study site during a controlled reservoir release. Travel time was defined as the amount of time the controlled reservoir release took to arrive at the study site. Peaks and travel time were evaluated visually, as shown in Fig. 3. In this example, the peak occurred on September 11 at 0000 hours. The travel time was 8 h.

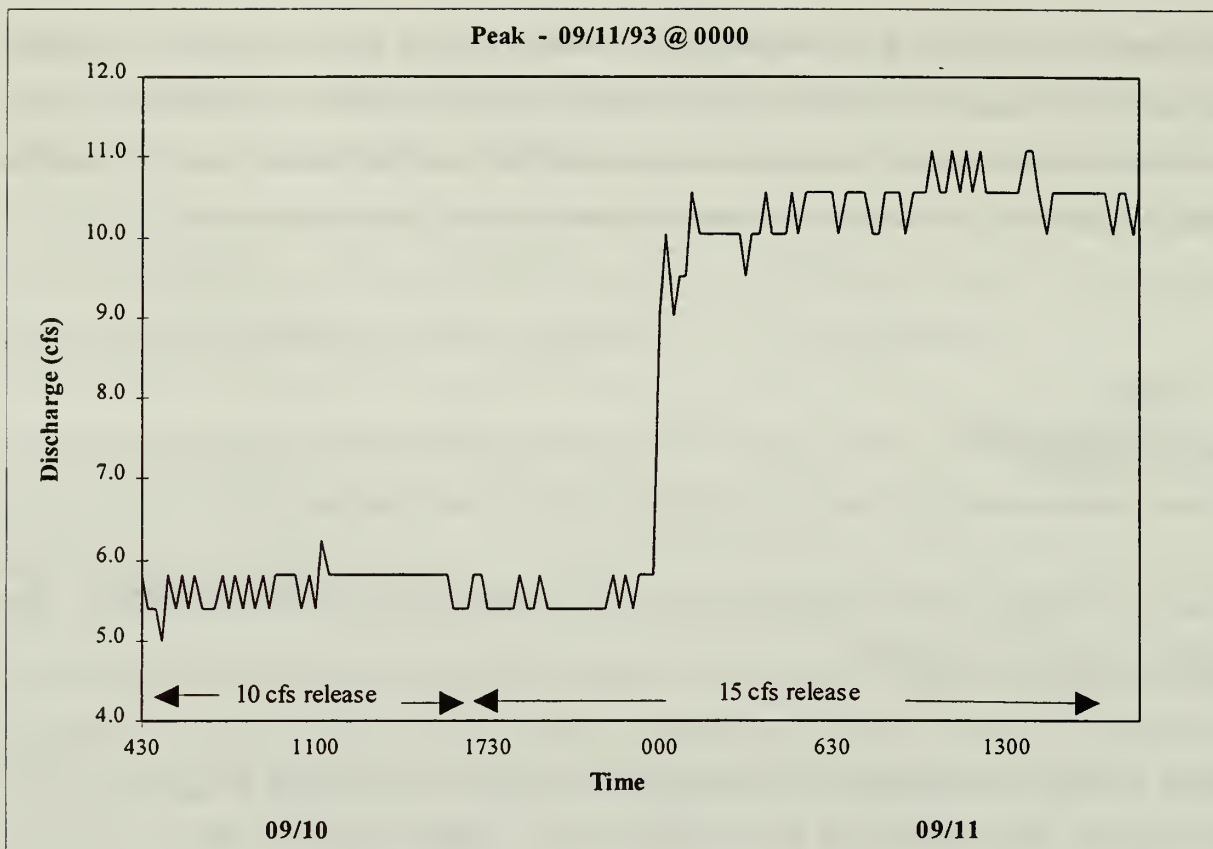


Fig. 3.-- Example of a graph used to evaluate peaks and travel time at Kolob Creek, Zion National Park.

## RESULTS

Mean daily discharge values for the flume at Kolob Reservoir are shown in Appendix A. Controlled reservoir releases and mean daily discharges were compared for whole days (0000 to 2400 hours) to evaluate differences in flows and are shown in Table 2. Mean daily discharges for September 4, 8, 10, 11, 14-17, 1993, could not be compared because releases were increased or decreased at 0800 or 1600 and skewed mean daily values.

Difference in flow between Kolob Reservoir and the study site ranged from 2.2 to 10 cfs and averaged 5 cfs during the study period (Table 3). The percentage of the controlled reservoir releases that did not reach the study site ranged from 12% to 78% and averaged 29.5%. The peak and travel time for each controlled reservoir release are shown in the last column.



Date	Controlled Reservoir release (cfs)	Mean daily flow (cfs)	Difference <sup>4</sup> (cfs)	Difference (%)
Sep 5	5	5.3	0.3	6.0
Sep 6	5	5.3	0.3	8.0
Sep 7	5	5.4	0.4	8.0
Sep 9	10	10.9	0.9	9.0
Sep 12	20	20.9	0.9	4.5
Sep 13	20	21.0	1.0	5.0

Table 2.--Comparison of controlled reservoir releases and mean daily flows at the Kolob Reservoir flume for September 5, 6, 7, 9, 12-13, 1993.

Generally, flow started increasing at the study site 30 to 45 min. before the peak occurred; afterwards, discharge remained fairly constant until the next controlled reservoir release. For example, on September 8, 10 cfs was released at 0800, and the associated peak reached the study site on the same day at 1945. The corresponding travel time for the flow was 11 h and 45 min. Travel times for flows of 15 to 30 cfs ranged from 8 to 5 h. The 35 cfs released at 1600 on September 16 had two peaks. The first peak rose 2.1 cfs and occurred on September 16 at 2100; travel time was 5 h. Flow remained constant for 3 to 4 h. The second peak of 3.8 cfs occurred on September 17 at 0015. Lateral channel storage was probably occurring between the first and second peaks.

Figure 4 compares controlled reservoir releases to measured discharges at the study site. The graph shows the relatively constant loss between the two sites. Figure 5 shows the mean daily hydrographs for the reservoir and study site and indicates a difference of about 5 cfs between the two sites.

A comparison of the releases was made to evaluate the differences and is shown in Table 4.

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<sup>4</sup> Mean daily discharge minus controlled reservoir releases.

Date	Time of release	Reservoir release (cfs) (1)	Time of meas.	Discharge (Q) (cfs) (2)	Difference (cfs) (3)	Percent (cfs) (4)	Approx. date/time peak was reached @ site
<b>09/04</b>	<b>0800</b>	<b>5</b>					
09/08		5	1910	1.1	3.9	78.0	09/08 @ 0115 travel time = 4 days
<b>09/08</b>	<b>0800</b>	<b>10</b>					
09/09		10	0920	5.6	4.4	44.0	09/08 @ 1945 travel time = 11 h 45 min.
09/09		10	1230	6.0	4.0	40.0	
09/09		10	1700	6.1	3.9	39.0	
09/10		10	0800	6.3	3.7	37.0	
09/10		10	1100	6.9	3.1	31.0	
09/10		10	1400	7.8	2.2	22.0	
09/10		10	1700	7.7	2.3	23.0	
<b>09/10</b>	<b>1600</b>	<b>15</b>					
09/11		15	0800	9.7	5.3	35.3	09/11 @ 0000 travel time = 8 h
09/11		15	1100	11	4.0	26.7	
09/11		15	1400	9.7	5.3	35.3	
09/11		15	1700	11	4.0	26.7	
<b>09/11</b>	<b>1600</b>	<b>20</b>					
09/12		20	0800	15	5.0	25.0	09/11 @ 2300 travel time = 7 h
09/12		20	1100	14	6.0	30.0	
09/12		20	1400	14	6.0	30.0	
09/12		20	1700	13	7.0	35.0	
09/13		20	0800	14	6.0	30.0	
09/13		20	1100	16	4.0	20.0	
09/13		20	1400	14	6.0	30.0	
09/13		20	1700	14	6.0	30.0	
09/14		20	0800	14	6.0	30.0	
09/14		20	1100	15	5.0	25.0	
09/14		20	1400	15	5.0	25.0	
09/14		20	1700	14	6.0	30.0	
<b>09/14</b>	<b>1600</b>	<b>25</b>					
09/15		25	0800	18	7.0	28.0	09/14 @ 2245 travel time = 6 h 45 min.
09/15		25	1100	21	4.0	16.0	
09/15		25	1400	18	7.0	28.0	
09/15		25	1700	22	3.0	12.0	
<b>09/15</b>	<b>1600</b>	<b>30</b>					
09/16		30	0800	20	10.0	33.3	09/15 @ 2115 travel time = 5 h 15 min.
09/16		30	1100	23	7.0	23.3	
09/16		30	1400	25	5.0	16.7	
09/16		30	1700	23	7.0	23.3	
<b>09/16</b>	<b>1600</b>	<b>35</b>					
09/17		35	0800	30	5.0	14.3	09/16 @ 2100 travel time = 5 h 09/17 @ 0015 2nd increase in stage
<b>09/17</b>	<b>1600</b>	<b>4</b>					
09/18							

(1) Controlled Reservoir Releases (CRR).

(2) Measured Q @ study site.

(3) Controlled Reservoir Releases - Measured Q @ study site.

(4)  $[Q(CRR) - Q(Kolob Ck)] / [Q(CRR)] \times 100$ .

Table 3. -- Summary of flow collected September 8-17, 1993, for Kolob study site and Reservoir, Zion National Park.

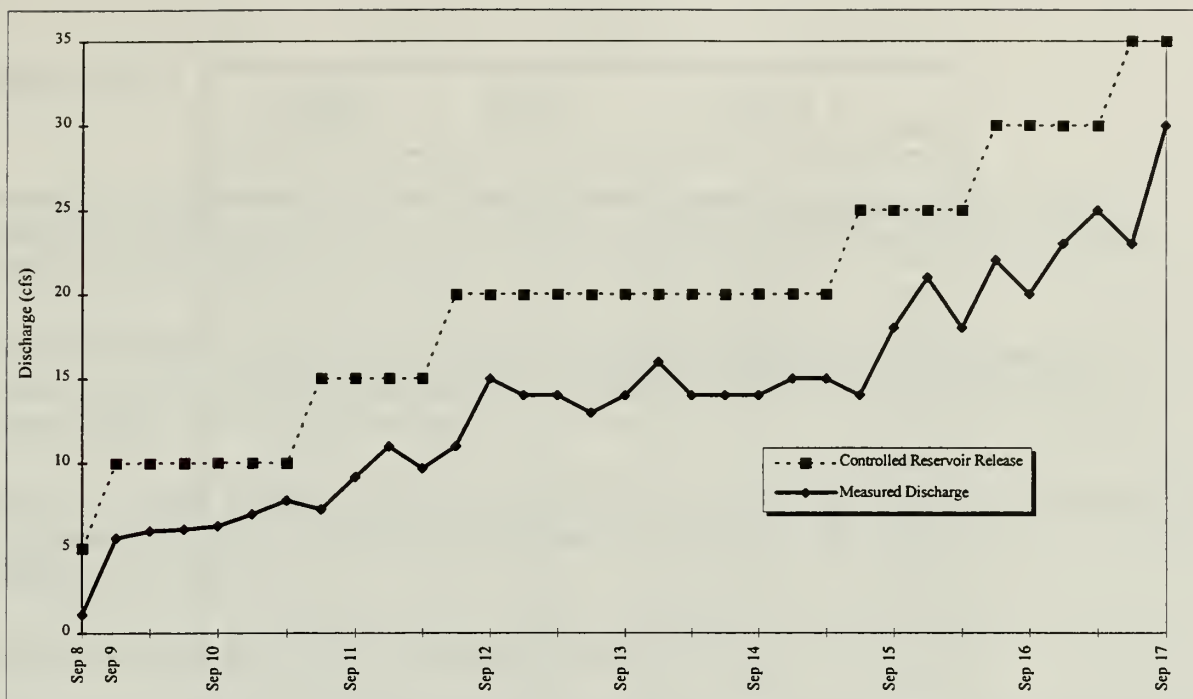


Figure 4. -- Comparison of corresponding releases from Kolob Reservoir to measured discharge on Kolob Creek, Zion National Park, 1993.

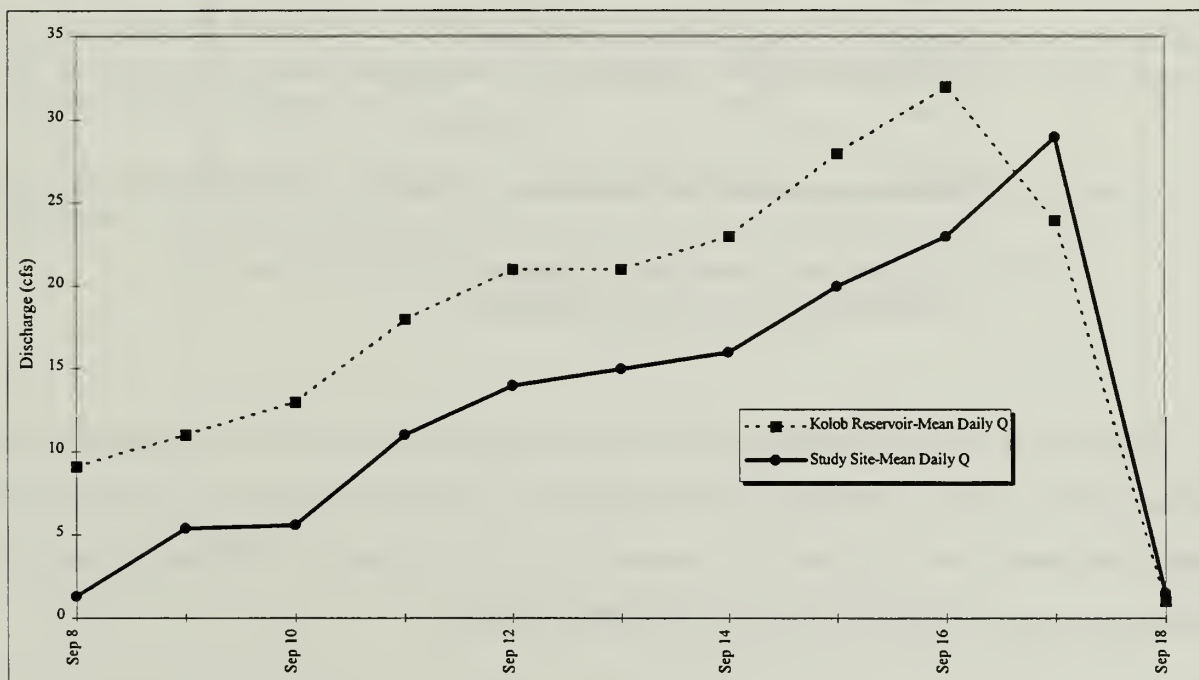


Figure 5. -- Mean daily hydrographs for Kolob Reservoir and study site on Kolob Creek, Zion National Park, 1993.

Date	Q (cfs) at study site	Q (cfs) at reservoir	Difference (ac-ft/day)
Sep 4	No Flow	3.9	-7.7
Sep 5	No Flow	5.3	-10.5
Sep 6	No Flow	5.4	-10.7
Sep 7	0.44	5.4	-9.8
Sep 8	1.30	9.1	-15.5
Sep 8	5.40	18.0	-11.1
Sep 10	5.60	13.0	-14.7
Sep 10	11.00	18.0	-13.9
Sep 12	11.00	21.0	-13.9
Sep 10	15.00	21.0	-11.9
Sep 10	16.00	23.0	-13.9
Sep 15	20.00	28.0	-15.7
Sep 16	23.00	32.0	-17.9
Sep 17	28.00	24.0	7.9
Sep 18	1.50	1.0	1.0

Table 4.--Comparison of mean daily discharges (Q) at Kolob study site and Reservoir and computed differences.

Daily differences of -7.7 to -17.9 ac-ft per day occurred, except for September 17-18, when Kolob Creek continued to flow after reservoir releases were reduced to 1 cfs. From September 4 to 18, a 158.3 ac-ft difference occurred at the study site, or an average loss of 5.3 cfs per day. Differences were variable depending on reservoir releases, travel time, and channel storage.



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## **APPENDIX A**



**UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE (WATER RIGHTS BRANCH)**

**ZION NATIONAL PARK, UT Discharge measurement of Kolob Creek above confluence with North Fork Virgin River,  
September 8-17, 1993**

No.	Date	Measurement made by	Time of day	Time meas. taken (min.)	# Sections	Width (ft)	Area (sq. ft)	Mean veloc. (ft/sec)	Discharge (cfs)	Stage height (ft)	Δ Stage Height (ft)	Method	Discharge equipment: current meter type and serial number
1	9/8/93	Moore	1014	35	15	7.95	2.73	0.38	1.10	-5.83	0	Wading	Pygmy - P90223
2	9/9/93	Moore	0920	60	27	10.50	4.50	1.23	4.91	-5.66	0	" "	" "
3	9/9/93	Hansen	1100	50	27	11.50	4.35	1.88	6.00	-5.66	0	" "	" "
4	9/9/93	Hansen	1614	54	26	11.50	3.62	1.88	13.0	-5.66	-.01	" "	" "
5	9/10/93	Stevens	0800	60	20	11.50	3.40	1.88	6.30	-5.66	0	" "	" "
6	9/10/93	Stevens	1116	59	16	11.50	2.50	2.40	7.00	-5.66	-.01	" "	" "
7	9/10/93	Newberry	1100	35	23	10.60	3.40	2.40	7.80	-5.66	0	" "	Pygmy - Y1076
8	9/10/93	Newberry	1100	50	24	9.30	2.50	2.50	7.30	-5.66	0	" "	" "
9	9/11/93	Stevens	0800	60	24	9.30	4.29	2.21	9.20	-5.66	-.01	" "	" "
10	9/11/93	Newberry	1100	35	25	9.30	4.79	2.23	14.0	-5.66	0	" "	" "
11	9/11/93	Stevens	1412	54	24	9.30	6.87	2.40	13.0	-5.66	0	" "	" "
12	9/11/93	Newberry	0800	35	22	9.30	6.67	2.40	14.0	-5.66	0	" "	" "
13	9/12/93	Newberry	0800	35	21	10.50	6.87	2.21	15.0	-5.52	0	" "	" "
14	9/12/93	Stevens	1100	59	22	10.50	6.72	2.21	14.0	-5.52	0	" "	" "
15	9/12/93	Newberry	1100	35	21	10.50	4.50	2.23	13.0	-5.52	0	" "	" "
16	9/12/93	Stevens	1614	35	21	10.50	6.87	1.88	13.0	-5.66	0	" "	" "
17	9/13/93	Stevens	0920	32	21	10.50	2.73	2.40	14.0	-5.66	0	" "	" "
18	9/13/93	Newberry	1100	35	22	10.50	4.50	2.23	16.0	-5.52	+.01	" "	" "

Compiled by: Nancy Stevens

**UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE (WATER RIGHTS BRANCH)**

**ZION NATIONAL PARK, UT Discharge measurement of Kolob Creek above confluence with North Fork Virgin River,  
September 8-17, 1993**

No.	Date	Measurement made by	Time of day	Time meas. taken (min.)	# Sections	Width (ft)	Area (sq. ft)	Mean veloc. (ft/sec)	Discharge (cfs)	Stage height (ft)	Δ Stage Height (ft)	Method	Discharge equipment: current meter type and serial number
19	9/13/93	Stevens	1425	35	21	10.0	7.06	2.00	14.0	-5.52	0	Wading	Pygmy - Y1076
20	9/13/93	Newberry	1645	35	21	10.0	7.09	1.99	14.0	-5.52	0	" "	" "
21	9/14/93	Newberry	0800	35	22	9.80	7.07	2.04	14.0	-5.52	0	" "	" "
22	9/14/93	Stevens	1125	50	19	9.20	7.20	2.06	15.0	-5.50	0	" "	Price AA - S90
23	9/14/93	Newberry	1405	35	19	9.20	6.94	2.17	15.0	-5.52	0	" "	" "
24	9/14/93	Stevens	1700	30	19	9.20	7.27	2.03	14.0	-5.50	0	" "	" "
25	9/15/93	Stevens	0800	45	21	10.20	8.24	2.29	18.0	-5.44	0	" "	" "
26	9/15/93	Newberry	1100	35	22	9.60	8.76	2.35	21.0	-5.44	0	" "	" "
27	9/15/93	Stevens	1400	36	22	10.00	8.50	2.19	18.0	-5.42	0	" "	" "
28	9/15/93	Newberry	1700	30	21	10.30	8.77	2.46	22.0	-5.44	0	" "	" "
29	9/16/93	Newberry	0800	35	22	10.40	8.62	2.35	20.0	-5.40	0	" "	" "
30	9/16/93	Stevens	1100	30	22	10.40	9.54	2.43	23.0	-5.38	0	" "	" "
31	9/16/93	Newberry	1400	30	22	10.40	9.98	2.51	25.0	-5.40	0	" "	" "
32	9/16/93	Stevens	1700	30	22	10.40	9.63	2.47	23.0	-5.42	+02	" "	" "
33	9/17/93	Stevens	0715	45	23	11.50	11.79	2.57	30.0	-5.28	-01	" "	" "

Compiled by: Nancy Stevens

## **APPENDIX B**







**KOLOB RESERVOIR RELEASES**  
**COMPUTED DISCHARGE & MEAN DAILY DISCHARGE**  
**SEPTEMBER 4 - 17, 1993**

DATE	TIME	STAGE (datalogger) (ft)	COMPUTED DISCHARGE (cfs)	COMPUTED MEAN DAILY DISCHARGE (cfs)
09/04/93	00:00:00	0.166	0.94	3.9
09/04/93	00:20:32	0.166	0.94	
09/04/93	00:40:32	0.166	0.94	
09/04/93	01:00:32	0.166	0.94	
09/04/93	01:20:32	0.166	0.94	
09/04/93	01:40:32	0.166	0.94	
09/04/93	02:00:32	0.172	1.00	
09/04/93	02:20:32	0.172	1.00	
09/04/93	02:40:32	0.166	0.94	
09/04/93	03:00:32	0.172	1.00	
09/04/93	03:20:32	0.172	1.00	
09/04/93	03:40:32	0.166	0.94	
09/04/93	04:00:32	0.166	0.94	
09/04/93	04:20:32	0.166	0.94	
09/04/93	04:40:32	0.166	0.94	
09/04/93	05:00:32	0.166	0.94	
09/04/93	05:20:32	0.166	0.94	
09/04/93	05:40:32	0.166	0.94	
09/04/93	06:00:32	0.166	0.94	
09/04/93	06:20:32	0.166	0.94	
09/04/93	06:40:32	0.166	0.94	
09/04/93	07:00:32	0.166	0.94	
09/04/93	07:20:32	0.166	0.94	
09/04/93	07:40:32	0.437	4.33	
09/04/93	08:00:32	0.478	4.99	
09/04/93	08:20:32	0.472	4.89	
09/04/93	08:40:32	0.466	4.80	
09/04/93	09:00:32	0.425	4.15	
09/04/93	09:20:32	0.384	3.53	
09/04/93	09:40:32	0.366	3.28	
09/04/93	10:00:32	0.378	3.45	
09/04/93	10:20:32	0.402	3.80	
09/04/93	10:40:32	0.425	4.15	
09/04/93	11:00:32	0.449	4.52	
09/04/93	11:20:32	0.443	4.43	
09/04/93	11:40:32	0.454	4.60	
09/04/93	12:00:32	0.466	4.80	
09/04/93	12:20:32	0.466	4.80	
09/04/93	12:40:32	0.478	4.99	
09/04/93	14:20:32	0.502	5.39	
09/04/93	14:40:32	0.525	5.79	

DATE	TIME	STAGE (datalogger) (ft)	COMPUTED DISCHARGE (cfs)	COMPUTED
				MEAN DAILY DISCHARGE (cfs)
09/04/93	15:20:32	0.525	5.79	
09/04/93	15:40:32	0.519	5.68	
09/04/93	16:00:32	0.513	5.58	
09/04/93	16:20:32	0.490	5.19	
09/04/93	16:40:32	0.496	5.29	
09/04/93	17:00:32	0.478	4.99	
09/04/93	17:20:32	0.513	5.58	
09/04/93	17:40:32	0.543	6.10	
09/04/93	18:00:32	0.549	6.21	
09/04/93	18:20:32	0.572	6.63	
09/04/93	18:40:32	0.584	6.85	
09/04/93	19:00:32	0.572	6.63	
09/04/93	19:20:32	0.560	6.41	
09/04/93	19:40:32	0.554	6.30	
09/04/93	20:00:32	0.554	6.30	
09/04/93	20:20:32	0.554	6.30	
09/04/93	20:40:32	0.549	6.21	
09/04/93	21:00:32	0.531	5.89	
09/04/93	21:20:32	0.519	5.68	
09/04/93	21:40:32	0.519	5.68	
09/04/93	22:00:32	0.519	5.68	
09/04/93	22:20:32	0.519	5.68	
09/04/93	22:40:32	0.519	5.68	
09/04/93	23:00:32	0.513	5.58	
09/04/93	23:20:32	0.519	5.68	
09/04/93	23:40:32	0.513	5.58	
<b>09/05/93</b>	<b>00:00:32</b>	<b>0.513</b>	<b>5.58</b>	<b>5.3</b>
09/05/93	00:20:32	0.513	5.58	
09/05/93	00:40:32	0.502	5.39	
09/05/93	01:00:32	0.502	5.39	
09/05/93	01:20:32	0.502	5.39	
09/05/93	01:40:32	0.502	5.39	
09/05/93	02:00:32	0.502	5.39	
09/05/93	02:20:32	0.502	5.39	
09/05/93	02:40:32	0.496	5.29	
09/05/93	03:00:32	0.502	5.39	
09/05/93	03:20:32	0.496	5.29	
09/05/93	03:40:32	0.496	5.29	
09/05/93	04:00:32	0.502	5.39	
09/05/93	04:20:32	0.496	5.29	
09/05/93	04:40:32	0.496	5.29	
09/05/93	05:00:32	0.496	5.29	
09/05/93	05:20:32	0.490	5.19	
09/05/93	05:40:32	0.490	5.19	

DATE	TIME	STAGE (datalogger) (ft)	COMPUTED DISCHARGE (cfs)	COMPUTED
				MEAN DAILY DISCHARGE (cfs)
09/05/93	07:40:32	0.490	5.19	
09/05/93	08:00:32	0.484	5.09	
09/05/93	08:20:32	0.472	4.89	
09/05/93	08:40:32	0.472	4.89	
09/05/93	09:00:32	0.425	4.15	
09/05/93	09:20:32	0.384	3.53	
09/05/93	09:40:32	0.384	3.53	
09/05/93	10:00:32	0.396	3.71	
09/05/93	10:20:32	0.407	3.87	
09/05/93	10:40:32	0.431	4.24	
09/05/93	11:00:32	0.484	5.09	
09/05/93	11:20:32	0.502	5.39	
09/05/93	11:40:32	0.490	5.19	
09/05/93	12:00:32	0.472	4.89	
09/05/93	12:20:32	0.484	5.09	
09/05/93	12:40:32	0.443	4.43	
09/05/93	13:00:32	0.478	4.99	
09/05/93	13:20:32	0.478	4.99	
09/05/93	13:40:32	0.449	4.52	
09/05/93	14:00:32	0.478	4.99	
09/05/93	14:20:32	0.472	4.89	
09/05/93	14:40:32	0.484	5.09	
09/05/93	15:00:32	0.466	4.80	
09/05/93	15:20:32	0.490	5.19	
09/05/93	15:40:32	0.502	5.39	
09/05/93	16:00:32	0.513	5.58	
09/05/93	16:20:32	0.531	5.89	
09/05/93	16:40:32	0.490	5.19	
09/05/93	17:00:32	0.478	4.99	
09/05/93	17:20:32	0.531	5.89	
09/05/93	17:40:32	0.554	6.30	
09/05/93	18:00:32	0.560	6.41	
09/05/93	18:20:32	0.584	6.85	
09/05/93	18:40:32	0.590	6.96	
09/05/93	19:00:32	0.578	6.74	
09/05/93	19:20:32	0.566	6.52	
09/05/93	19:40:32	0.560	6.41	
09/05/93	20:00:32	0.560	6.41	
09/05/93	20:20:32	0.554	6.30	
09/05/93	20:40:32	0.543	6.10	
09/05/93	21:00:32	0.531	5.89	
09/05/93	21:20:32	0.531	5.89	
09/05/93	21:40:32	0.525	5.79	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/05/93	22:00:32	0.519	5.68	
09/05/93	22:20:32	0.513	5.58	
09/05/93	22:40:32	0.513	5.58	
09/05/93	23:00:32	0.519	5.68	
09/05/93	23:20:32	0.507	5.48	
09/05/93	23:40:32	0.513	5.58	
<b>09/06/93</b>	<b>00:00:32</b>	<b>0.519</b>	<b>5.68</b>	<b>5.4</b>
09/06/93	00:20:32	0.513	5.58	
09/06/93	00:40:32	0.507	5.48	
09/06/93	01:00:32	0.513	5.58	
09/06/93	01:20:32	0.513	5.58	
09/06/93	01:40:32	0.507	5.48	
09/06/93	02:00:32	0.496	5.29	
09/06/93	02:20:32	0.507	5.48	
09/06/93	02:40:32	0.507	5.48	
09/06/93	03:00:32	0.496	5.29	
09/06/93	03:20:32	0.502	5.39	
09/06/93	03:40:32	0.513	5.58	
09/06/93	04:00:32	0.496	5.29	
09/06/93	04:20:32	0.507	5.48	
09/06/93	04:40:32	0.502	5.39	
09/06/93	05:00:32	0.507	5.48	
09/06/93	05:20:32	0.507	5.48	
09/06/93	05:40:32	0.507	5.48	
09/06/93	06:00:32	0.496	5.29	
09/06/93	06:20:32	0.507	5.48	
09/06/93	06:40:32	0.507	5.48	
09/06/93	07:00:32	0.507	5.48	
09/06/93	07:20:32	0.496	5.29	
09/06/93	07:40:32	0.490	5.19	
09/06/93	08:00:32	0.478	4.99	
09/06/93	08:20:32	0.478	4.99	
09/06/93	08:40:32	0.472	4.89	
09/06/93	09:00:32	0.449	4.52	
09/06/93	09:20:32	0.378	3.45	
09/06/93	09:40:32	0.378	3.45	
09/06/93	10:00:32	0.402	3.80	
09/06/93	10:20:32	0.407	3.87	
09/06/93	10:40:32	0.419	4.06	
09/06/93	11:00:32	0.425	4.15	
09/06/93	11:20:32	0.454	4.60	
09/06/93	11:40:32	0.472	4.89	

DATE	TIME	STAGE (datalogger) (ft)	COMPUTED DISCHARGE (cfs)	COMPUTED
				MEAN DAILY DISCHARGE (cfs)
09/06/93	12:00:32	0.466	4.80	
09/06/93	12:20:32	0.472	4.89	
09/06/93	12:40:32	0.507	5.48	
09/06/93	13:00:32	0.502	5.39	
09/06/93	13:20:32	0.449	4.52	
09/06/93	13:40:32	0.478	4.99	
09/06/93	14:00:32	0.531	5.89	
09/06/93	14:20:32	0.502	5.39	
09/06/93	14:40:32	0.507	5.48	
09/06/93	15:00:32	0.525	5.79	
09/06/93	15:20:32	0.496	5.29	
09/06/93	15:40:32	0.531	5.89	
09/06/93	16:00:32	0.531	5.89	
09/06/93	16:40:32	0.502	5.39	
09/06/93	17:00:32	0.543	6.10	
09/06/93	17:20:32	0.543	6.10	
09/06/93	17:40:32	0.543	6.10	
09/06/93	18:00:32	0.537	6.00	
09/06/93	18:20:32	0.560	6.41	
09/06/93	18:40:32	0.566	6.52	
09/06/93	19:00:32	0.566	6.52	
09/06/93	19:20:32	0.549	6.21	
09/06/93	19:40:32	0.549	6.21	
09/06/93	20:00:32	0.554	6.30	
09/06/93	20:20:32	0.560	6.41	
09/06/93	20:40:32	0.549	6.21	
09/06/93	21:00:32	0.531	5.89	
09/06/93	21:20:32	0.531	5.89	
09/06/93	21:40:32	0.525	5.79	
09/06/93	22:00:32	0.525	5.79	
09/06/93	22:20:32	0.519	5.68	
09/06/93	22:40:32	0.519	5.68	
09/06/93	23:00:32	0.519	5.68	
09/06/93	23:20:32	0.519	5.68	
09/06/93	23:40:32	0.513	5.58	
<b>09/07/93</b>	<b>00:00:32</b>	<b>0.513</b>	<b>5.58</b>	<b>5.4</b>
09/07/93	00:20:32	0.519	5.68	
09/07/93	00:40:32	0.507	5.48	
09/07/93	01:00:32	0.519	5.68	
09/07/93	01:20:32	0.519	5.68	
09/07/93	01:40:32	0.525	5.79	
09/07/93	02:00:32	0.519	5.68	



DATE	TIME	STAGE (datalogger) (ft)	COMPUTED DISCHARGE (cfs)	COMPUTED
				MEAN DAILY DISCHARGE (cfs)
09/07/93	02:20:32	0.513	5.58	
09/07/93	02:40:32	0.502	5.39	
09/07/93	03:00:32	0.513	5.58	
09/07/93	03:20:32	0.502	5.39	
09/07/93	03:40:32	0.513	5.58	
09/07/93	04:00:32	0.502	5.39	
09/07/93	04:20:32	0.513	5.58	
09/07/93	04:40:32	0.496	5.29	
09/07/93	05:00:32	0.502	5.39	
09/07/93	05:20:32	0.502	5.39	
09/07/93	05:40:32	0.502	5.39	
09/07/93	06:00:32	0.502	5.39	
09/07/93	06:20:32	0.502	5.39	
09/07/93	06:40:32	0.502	5.39	
09/07/93	07:00:32	0.502	5.39	
09/07/93	07:20:32	0.496	5.29	
09/07/93	07:40:32	0.490	5.19	
09/07/93	08:00:32	0.484	5.09	
09/07/93	08:20:32	0.490	5.19	
09/07/93	08:40:32	0.478	4.99	
09/07/93	09:00:32	0.443	4.43	
09/07/93	09:40:32	0.372	3.36	
09/07/93	10:00:32	0.396	3.71	
09/07/93	10:20:32	0.402	3.80	
09/07/93	10:40:32	0.425	4.15	
09/07/93	11:00:32	0.425	4.15	
09/07/93	11:20:32	0.443	4.43	
09/07/93	11:40:32	0.449	4.52	
09/07/93	12:00:32	0.460	4.70	
09/07/93	12:20:32	0.466	4.80	
09/07/93	12:40:32	0.478	4.99	
09/07/93	13:00:32	0.478	4.99	
09/07/93	13:20:32	0.478	4.99	
09/07/93	13:40:32	0.490	5.19	
09/07/93	14:00:32	0.484	5.09	
09/07/93	14:20:32	0.496	5.29	
09/07/93	14:40:32	0.502	5.39	
09/07/93	15:00:32	0.507	5.48	
09/07/93	15:20:32	0.502	5.39	
09/07/93	15:40:32	0.496	5.29	
09/07/93	16:00:32	0.502	5.39	

DATE	TIME	STAGE (datalogger) (ft)	COMPUTED DISCHARGE (cfs)	COMPUTED
				MEAN DAILY DISCHARGE (cfs)
09/07/93	16:20:32	0.513	5.58	
09/07/93	16:40:32	0.519	5.68	
09/07/93	17:00:32	0.525	5.79	
09/07/93	17:20:32	0.566	6.52	
09/07/93	17:40:32	0.578	6.74	
09/07/93	18:00:32	0.578	6.74	
09/07/93	18:20:32	0.596	7.07	
09/07/93	18:40:32	0.596	7.07	
09/07/93	19:00:32	0.572	6.63	
09/07/93	19:20:32	0.572	6.63	
09/07/93	19:40:32	0.572	6.63	
09/07/93	20:00:32	0.566	6.52	
09/07/93	20:20:32	0.543	6.10	
09/07/93	20:40:32	0.531	5.89	
09/07/93	21:00:32	0.543	6.10	
09/07/93	21:20:32	0.537	6.00	
09/07/93	21:40:32	0.525	5.79	
09/07/93	22:00:32	0.531	5.89	
09/07/93	22:20:32	0.537	6.00	
09/07/93	22:40:32	0.537	6.00	
09/07/93	23:00:32	0.531	5.89	
09/07/93	23:20:32	0.513	5.58	
09/07/93	23:40:32	0.513	5.58	
<b>09/08/93</b>	<b>00:00:32</b>	<b>0.513</b>	<b>5.58</b>	<b>9.1</b>
09/08/93	00:20:32	0.525	5.79	
09/08/93	00:40:32	0.525	5.79	
09/08/93	01:00:32	0.513	5.58	
09/08/93	01:20:32	0.513	5.58	
09/08/93	01:40:32	0.507	5.48	
09/08/93	02:00:32	0.496	5.29	
09/08/93	02:40:32	0.490	5.19	
09/08/93	03:00:32	0.484	5.09	
09/08/93	03:20:32	0.490	5.19	
09/08/93	03:40:32	0.502	5.39	
09/08/93	04:00:32	0.496	5.29	
09/08/93	04:20:32	0.490	5.19	
09/08/93	04:40:32	0.490	5.19	
09/08/93	05:00:32	0.502	5.39	

DATE	TIME	STAGE (datalogger) (ft)	COMPUTED DISCHARGE (cfs)	COMPUTED
				MEAN DAILY DISCHARGE (cfs)
09/08/93	05:20:32	0.502	5.39	
09/08/93	05:40:32	0.490	5.19	
09/08/93	06:00:32	0.490	5.19	
09/08/93	06:20:32	0.502	5.39	
09/08/93	06:40:32	0.490	5.19	
09/08/93	07:00:32	0.507	5.48	
09/08/93	07:20:32	0.507	5.48	
09/08/93	07:40:32	0.502	5.39	
09/08/93	08:00:32	0.678	8.67	
09/08/93	08:20:32	0.772	10.64	
09/08/93	08:40:32	0.760	10.38	
09/08/93	09:00:32	0.737	9.89	
09/08/93	09:20:32	0.707	9.26	
09/08/93	09:40:32	0.696	9.03	
09/08/93	10:00:32	0.690	8.91	
09/08/93	10:20:32	0.690	8.91	
09/08/93	10:40:32	0.707	9.26	
09/08/93	11:00:32	0.725	9.63	
09/08/93	11:20:32	0.748	10.12	
09/08/93	11:40:32	0.743	10.01	
09/08/93	12:00:32	0.743	10.01	
09/08/93	12:20:32	0.754	10.25	
09/08/93	12:40:32	0.760	10.38	
09/08/93	13:00:32	0.778	10.77	
09/08/93	13:20:32	0.772	10.64	
09/08/93	13:40:32	0.772	10.64	
09/08/93	14:00:32	0.784	10.90	
09/08/93	14:20:32	0.778	10.77	
09/08/93	14:40:32	0.784	10.90	
09/08/93	15:00:32	0.778	10.77	
09/08/93	15:20:32	0.784	10.90	
09/08/93	15:40:32	0.790	11.03	
09/08/93	16:00:32	0.784	10.90	
09/08/93	16:20:32	0.790	11.03	
09/08/93	16:40:32	0.795	11.14	
09/08/93	17:00:32	0.801	11.27	
09/08/93	17:20:32	0.848	12.33	
09/08/93	17:40:32	0.848	12.33	
09/08/93	18:00:32	0.848	12.33	
09/08/93	18:20:32	0.860	12.61	
09/08/93	18:40:32	0.854	12.47	
09/08/93	19:00:32	0.842	12.20	



DATE	TIME	STAGE (datalogger) (ft)	COMPUTED DISCHARGE (cfs)	COMPUTED
				MEAN DAILY DISCHARGE (cfs)
09/08/93	19:20:32	0.837	12.08	
09/08/93	19:40:32	0.842	12.20	
09/08/93	20:00:32	0.848	12.33	
09/08/93	20:20:32	0.842	12.20	
09/08/93	20:40:32	0.825	11.81	
09/08/93	21:00:32	0.825	11.81	
09/08/93	21:20:32	0.819	11.68	
09/08/93	21:40:32	0.807	11.41	
09/08/93	22:00:32	0.819	11.68	
09/08/93	22:20:32	0.819	11.68	
09/08/93	22:40:32	0.795	11.14	
09/08/93	23:00:32	0.813	11.54	
09/08/93	23:20:32	0.795	11.14	
09/08/93	23:40:32	0.801	11.27	
<b>09/09/93</b>	<b>00:00:32</b>	<b>0.778</b>	<b>10.77</b>	<b>10.9</b>
09/09/93	00:20:32	0.795	11.14	
09/09/93	00:40:32	0.795	11.14	
09/09/93	01:00:32	0.784	10.90	
09/09/93	01:20:32	0.784	10.90	
09/09/93	01:40:32	0.784	10.90	
09/09/93	02:00:32	0.772	10.64	
09/09/93	02:20:32	0.760	10.38	
09/09/93	02:40:32	0.766	10.51	
09/09/93	03:00:32	0.760	10.38	
09/09/93	03:20:32	0.766	10.51	
09/09/93	03:40:32	0.766	10.51	
09/09/93	04:00:32	0.772	10.64	
09/09/93	04:20:32	0.772	10.64	
09/09/93	04:40:32	0.760	10.38	
09/09/93	05:00:32	0.766	10.51	
09/09/93	05:20:32	0.784	10.90	
09/09/93	05:40:32	0.784	10.90	
09/09/93	06:00:32	0.790	11.03	
09/09/93	06:20:32	0.778	10.77	
09/09/93	06:40:32	0.790	11.03	
09/09/93	07:00:32	0.778	10.77	
09/09/93	07:20:32	0.795	11.14	
09/09/93	07:40:32	0.813	11.54	
09/09/93	08:00:32	0.790	11.03	
09/09/93	08:20:32	0.790	11.03	
09/09/93	08:40:32	0.772	10.64	
09/09/93	09:00:32	0.713	9.38	
09/09/93	09:20:32	0.678	8.67	

DATE	TIME	STAGE (datalogger) (ft)	COMPUTED DISCHARGE (cfs)	COMPUTED
				MEAN DAILY DISCHARGE (cfs)
09/09/93	09:40:32	0.678	8.67	
09/09/93	10:00:32	0.678	8.67	
09/09/93	10:20:32	0.678	8.67	
09/09/93	10:40:32	0.690	8.91	
09/09/93	11:00:32	0.701	9.13	
09/09/93	11:20:32	0.719	9.51	
09/09/93	11:40:32	0.737	9.89	
09/09/93	12:00:32	0.737	9.89	
09/09/93	12:20:32	0.719	9.51	
09/09/93	12:40:32	0.743	10.01	
09/09/93	13:00:32	0.760	10.38	
09/09/93	13:20:32	0.772	10.64	
09/09/93	13:40:32	0.766	10.51	
09/09/93	14:00:32	0.772	10.64	
09/09/93	14:20:32	0.790	11.03	
09/09/93	14:40:32	0.790	11.03	
09/09/93	15:00:32	0.784	10.90	
09/09/93	15:20:32	0.790	11.03	
09/09/93	15:40:32	0.790	11.03	
09/09/93	16:00:32	0.790	11.03	
09/09/93	16:20:32	0.801	11.27	
09/09/93	16:40:32	0.801	11.27	
09/09/93	17:00:32	0.819	11.68	
09/09/93	17:20:32	0.872	12.89	
09/09/93	17:40:32	0.872	12.89	
09/09/93	18:00:32	0.872	12.89	
09/09/93	18:20:32	0.878	13.03	
09/09/93	18:40:32	0.878	13.03	
09/09/93	19:00:32	0.860	12.61	
09/09/93	19:20:32	0.848	12.33	
09/09/93	19:40:32	0.842	12.20	
09/09/93	20:00:32	0.842	12.20	
09/09/93	20:20:32	0.837	12.08	
09/09/93	20:40:32	0.825	11.81	
09/09/93	21:00:32	0.807	11.41	
09/09/93	21:20:32	0.801	11.27	
09/09/93	21:40:32	0.795	11.14	
09/09/93	22:00:32	0.801	11.27	
09/09/93	22:20:32	0.801	11.27	
09/09/93	22:40:32	0.801	11.27	
09/09/93	23:00:32	0.801	11.27	

DATE	TIME	STAGE (datalogger) (ft)	COMPUTED DISCHARGE (cfs)	COMPUTED
				MEAN DAILY DISCHARGE (cfs)
09/09/93	23:20:32	0.801	11.27	
09/09/93	23:40:32	0.795	11.14	
<b>09/10/93</b>	<b>00:00:32</b>	<b>0.795</b>	<b>11.14</b>	<b>12.7</b>
09/10/93	00:20:32	0.801	11.27	
09/10/93	00:40:32	0.807	11.41	
09/10/93	01:00:32	0.795	11.14	
09/10/93	01:20:32	0.795	11.14	
09/10/93	01:40:32	0.784	10.90	
09/10/93	02:00:32	0.795	11.14	
09/10/93	02:20:32	0.784	10.90	
09/10/93	02:40:32	0.784	10.90	
09/10/93	03:00:32	0.784	10.90	
09/10/93	03:20:32	0.784	10.90	
09/10/93	03:40:32	0.790	11.03	
09/10/93	04:00:32	0.790	11.03	
09/10/93	04:20:32	0.790	11.03	
09/10/93	04:40:32	0.790	11.03	
09/10/93	05:00:32	0.790	11.03	
09/10/93	05:20:32	0.790	11.03	
09/10/93	05:40:32	0.784	10.90	
09/10/93	06:00:32	0.790	11.03	
09/10/93	06:20:32	0.795	11.14	
09/10/93	06:40:32	0.795	11.14	
09/10/93	07:00:32	0.790	11.03	
09/10/93	07:20:32	0.784	10.90	
09/10/93	07:40:32	0.784	10.90	
09/10/93	08:00:32	0.778	10.77	
09/10/93	08:20:32	0.766	10.51	
09/10/93	08:40:32	0.760	10.38	
09/10/93	09:00:32	0.731	9.76	
09/10/93	09:20:32	0.654	8.19	
09/10/93	09:40:32	0.643	7.97	
09/10/93	10:00:32	0.643	7.97	
09/10/93	10:20:32	0.654	8.19	
09/10/93	10:40:32	0.684	8.79	
09/10/93	11:00:32	0.707	9.26	
09/10/93	11:20:32	0.719	9.51	
09/10/93	11:40:32	0.731	9.76	
09/10/93	12:00:32	0.743	10.01	
09/10/93	12:20:32	0.743	10.01	
09/10/93	12:40:32	0.754	10.25	
09/10/93	13:00:32	0.766	10.51	

DATE	TIME	STAGE (datalogger) (ft)	COMPUTED	
			COMPUTED DISCHARGE (cfs)	MEAN DAILY DISCHARGE (cfs)
09/10/93	13:20:32	0.772	10.64	
09/10/93	13:40:32	0.784	10.90	
09/10/93	14:00:32	0.784	10.90	
09/10/93	14:20:32	0.784	10.90	
09/10/93	14:40:32	0.784	10.90	
09/10/93	15:00:32	0.784	10.90	
09/10/93	15:20:32	0.784	10.90	
09/10/93	15:40:32	0.972	15.30	
09/10/93	16:00:32	0.989	15.72	
09/10/93	16:20:32	0.989	15.72	
09/10/93	16:40:32	0.995	15.87	
09/10/93	17:00:32	1.013	16.33	
09/10/93	17:20:32	1.078	18.01	
09/10/93	17:40:32	1.078	18.01	
09/10/93	18:00:32	1.078	18.01	
09/10/93	18:20:32	1.084	18.17	
09/10/93	18:40:32	1.078	18.01	
09/10/93	19:00:32	1.066	17.70	
09/10/93	19:20:32	1.066	17.70	
09/10/93	19:40:32	1.066	17.70	
09/10/93	20:00:32	1.060	17.54	
09/10/93	20:20:32	1.054	17.38	
09/10/93	20:40:32	1.042	17.07	
09/10/93	21:00:32	1.025	16.64	
09/10/93	21:20:32	1.019	16.48	
09/10/93	21:40:32	1.013	16.33	
09/10/93	22:00:32	1.019	16.48	
09/10/93	22:20:32	1.019	16.48	
09/10/93	22:40:32	1.019	16.48	
09/10/93	23:00:32	1.013	16.33	
09/10/93	23:20:32	1.013	16.33	
09/10/93	23:40:32	1.013	16.33	
<b>09/11/93</b>	<b>00:00:32</b>	<b>1.007</b>	<b>16.18</b>	<b>17.6</b>
09/11/93	00:20:32	0.995	15.87	
09/11/93	00:40:32	1.001	16.03	
09/11/93	01:00:32	1.007	16.18	
09/11/93	01:20:32	0.995	15.87	
09/11/93	01:40:32	0.995	15.87	
09/11/93	02:00:32	0.995	15.87	
09/11/93	02:20:32	1.001	16.03	
09/11/93	02:40:32	0.989	15.72	
09/11/93	03:00:32	1.001	16.03	
09/11/93	03:20:32	1.001	16.03	

DATE	TIME	STAGE (datalogger) (ft)	COMPUTED DISCHARGE (cfs)	COMPUTED
				MEAN DAILY DISCHARGE (cfs)
09/11/93	03:40:32	1.001	16.03	
09/11/93	04:00:32	0.984	15.60	
09/11/93	04:20:32	0.978	15.45	
09/11/93	04:40:32	0.960	15.00	
09/11/93	05:00:32	0.966	15.15	
09/11/93	05:20:32	0.972	15.30	
09/11/93	05:40:32	0.972	15.30	
09/11/93	06:00:32	0.972	15.30	
09/11/93	06:20:32	0.984	15.60	
09/11/93	06:40:32	0.989	15.72	
09/11/93	07:00:32	0.984	15.60	
09/11/93	07:20:32	0.995	15.87	
09/11/93	07:40:32	0.989	15.72	
09/11/93	08:00:32	0.978	15.45	
09/11/93	08:20:32	0.972	15.30	
09/11/93	08:40:32	0.966	15.15	
09/11/93	09:00:32	0.954	14.85	
09/11/93	09:20:32	0.901	13.57	
09/11/93	09:40:32	0.872	12.89	
09/11/93	10:00:32	0.890	13.31	
09/11/93	10:20:32	0.901	13.57	
09/11/93	10:40:32	0.925	14.15	
09/11/93	11:00:32	0.925	14.15	
09/11/93	11:20:32	0.931	14.29	
09/11/93	11:40:32	0.937	14.44	
09/11/93	12:00:32	0.942	14.56	
09/11/93	12:20:32	0.954	14.85	
09/11/93	12:40:32	0.960	15.00	
09/11/93	13:00:32	0.966	15.15	
09/11/93	13:20:32	0.978	15.45	
09/11/93	13:40:32	0.972	15.30	
09/11/93	14:00:32	0.989	15.72	
09/11/93	14:20:32	0.989	15.72	
09/11/93	14:40:32	0.995	15.87	
09/11/93	15:00:32	0.989	15.72	
09/11/93	15:20:32	0.989	15.72	
09/11/93	15:40:32	1.195	21.19	
09/11/93	16:00:32	1.195	21.19	
09/11/93	16:20:32	1.189	21.03	
09/11/93	16:40:32	1.195	21.19	
09/11/93	17:00:32	1.219	21.87	
09/11/93	17:20:32	1.266	23.21	
09/11/93	17:40:32	1.266	23.21	
09/11/93	18:00:32	1.266	23.21	



DATE	TIME	STAGE (datalogger) (ft)	COMPUTED DISCHARGE (cfs)	COMPUTED
				MEAN DAILY DISCHARGE (cfs)
09/11/93	18:20:32	1.272	23.39	
09/11/93	18:40:32	1.266	23.21	
09/11/93	19:00:32	1.248	22.70	
09/11/93	19:20:32	1.248	22.70	
09/11/93	19:40:32	1.248	22.70	
09/11/93	20:00:32	1.248	22.70	
09/11/93	20:20:32	1.230	22.18	
09/11/93	20:40:32	1.225	22.04	
09/11/93	21:00:32	1.213	21.70	
09/11/93	21:20:32	1.213	21.70	
09/11/93	21:40:32	1.213	21.70	
09/11/93	22:00:32	1.213	21.70	
09/11/93	22:20:32	1.207	21.53	
09/11/93	22:40:32	1.207	21.53	
09/11/93	23:00:32	1.195	21.19	
09/11/93	23:20:32	1.201	21.36	
09/11/93	23:40:32	1.189	21.03	
<b>09/12/93</b>	<b>00:00:32</b>	<b>1.189</b>	<b>21.03</b>	<b>20.9</b>
09/12/93	00:20:32	1.189	21.03	
09/12/93	00:40:32	1.201	21.36	
09/12/93	01:00:32	1.195	21.19	
09/12/93	01:20:32	1.183	20.86	
09/12/93	01:40:32	1.189	21.03	
09/12/93	02:00:32	1.183	20.86	
09/12/93	02:20:32	1.183	20.86	
09/12/93	02:40:32	1.189	21.03	
09/12/93	03:00:32	1.178	20.72	
09/12/93	03:20:32	1.183	20.86	
09/12/93	03:40:32	1.178	20.72	
09/12/93	04:00:32	1.178	20.72	
09/12/93	04:20:32	1.178	20.72	
09/12/93	04:40:32	1.178	20.72	
09/12/93	05:00:32	1.178	20.72	
09/12/93	05:20:32	1.189	21.03	
09/12/93	05:40:32	1.189	21.03	
09/12/93	06:00:32	1.189	21.03	
09/12/93	06:20:32	1.195	21.19	



DATE	TIME	STAGE (datalogger) (ft)	COMPUTED	
			COMPUTED DISCHARGE (cfs)	MEAN DAILY DISCHARGE (cfs)
09/12/93	06:40:32	1.189	21.03	
09/12/93	07:00:32	1.189	21.03	
09/12/93	07:20:32	1.195	21.19	
09/12/93	07:40:32	1.195	21.19	
09/12/93	08:00:32	1.178	20.72	
09/12/93	08:20:32	1.166	20.39	
09/12/93	08:40:32	1.148	19.89	
09/12/93	09:00:32	1.125	19.27	
09/12/93	09:20:32	1.084	18.17	
09/12/93	09:40:32	1.078	18.01	
09/12/93	10:00:32	1.095	18.46	
09/12/93	10:20:32	1.107	18.78	
09/12/93	10:40:32	1.107	18.78	
09/12/93	11:00:32	1.107	18.78	
09/12/93	11:20:32	1.131	19.43	
09/12/93	11:40:32	1.142	19.73	
09/12/93	12:00:32	1.154	20.06	
09/12/93	12:20:32	1.166	20.39	
09/12/93	12:40:32	1.154	20.06	
09/12/93	13:00:32	1.160	20.22	
09/12/93	13:20:32	1.172	20.55	
09/12/93	13:40:32	1.172	20.55	
09/12/93	14:00:32	1.172	20.55	
09/12/93	14:20:32	1.183	20.86	
09/12/93	14:40:32	1.183	20.86	
09/12/93	15:00:32	1.183	20.86	
09/12/93	15:20:32	1.178	20.72	
09/12/93	15:40:32	1.172	20.55	
09/12/93	16:00:32	1.178	20.72	
09/12/93	16:20:32	1.189	21.03	
09/12/93	16:40:32	1.195	21.19	
09/12/93	17:00:32	1.207	21.53	
09/12/93	17:20:32	1.254	22.87	
09/12/93	17:40:32	1.260	23.04	
09/12/93	18:00:32	1.266	23.21	
09/12/93	18:20:32	1.254	22.87	
09/12/93	18:40:32	1.242	22.52	
09/12/93	19:00:32	1.230	22.18	
09/12/93	19:20:32	1.230	22.18	
09/12/93	19:40:32	1.225	22.04	
09/12/93	20:00:32	1.225	22.04	
09/12/93	20:20:32	1.207	21.53	
09/12/93	20:40:32	1.201	21.36	

DATE	TIME	STAGE (datalogger) (ft)	COMPUTED DISCHARGE (cfs)	COMPUTED
				MEAN DAILY DISCHARGE (cfs)
09/12/93	21:00:32	1.201	21.36	
09/12/93	21:20:32	1.189	21.03	
09/12/93	21:40:32	1.189	21.03	
09/12/93	22:00:32	1.207	21.53	
09/12/93	22:20:32	1.213	21.70	
09/12/93	22:40:32	1.213	21.70	
09/12/93	23:00:32	1.207	21.53	
09/12/93	23:20:32	1.195	21.19	
09/12/93	23:40:32	1.201	21.36	
<b>09/13/93</b>	<b>00:00:32</b>	<b>1.201</b>	<b>21.36</b>	<b>21.0</b>
09/13/93	00:20:32	1.207	21.53	
09/13/93	00:40:32	1.201	21.36	
09/13/93	01:00:32	1.195	21.19	
09/13/93	01:20:32	1.201	21.36	
09/13/93	01:40:32	1.195	21.19	
09/13/93	02:00:32	1.195	21.19	
09/13/93	02:20:32	1.201	21.36	
09/13/93	02:40:32	1.195	21.19	
09/13/93	03:00:32	1.195	21.19	
09/13/93	03:20:32	1.195	21.19	
09/13/93	03:40:32	1.183	20.86	
09/13/93	04:00:32	1.183	20.86	
09/13/93	04:20:32	1.195	21.19	
09/13/93	04:40:32	1.183	20.86	
09/13/93	05:00:32	1.195	21.19	
09/13/93	05:20:32	1.195	21.19	
09/13/93	05:40:32	1.183	20.86	
09/13/93	06:00:32	1.195	21.19	
09/13/93	06:20:32	1.189	21.03	
09/13/93	06:40:32	1.189	21.03	
09/13/93	07:00:32	1.189	21.03	
09/13/93	07:20:32	1.189	21.03	
09/13/93	07:40:32	1.189	21.03	
09/13/93	08:00:32	1.189	21.03	
09/13/93	08:20:32	1.183	20.86	
09/13/93	08:40:32	1.172	20.55	
09/13/93	09:00:32	1.148	19.89	
09/13/93	09:20:32	1.131	19.43	
09/13/93	09:40:32	1.119	19.11	
09/13/93	10:00:32	1.113	18.94	
09/13/93	10:20:32	1.119	19.11	
09/13/93	10:40:32	1.142	19.73	
09/13/93	11:00:32	1.148	19.89	
09/13/93	11:20:32	1.154	20.06	

DATE	TIME	STAGE (datalogger) (ft)	COMPUTED DISCHARGE (cfs)	COMPUTED
				MEAN DAILY DISCHARGE (cfs)
09/13/93	11:40:32	1.148	19.89	
09/13/93	12:00:32	1.148	19.89	
09/13/93	12:20:32	1.148	19.89	
09/13/93	12:40:32	1.160	20.22	
09/13/93	13:00:32	1.160	20.22	
09/13/93	13:20:32	1.166	20.39	
09/13/93	13:40:32	1.172	20.55	
09/13/93	14:00:32	1.189	21.03	
09/13/93	14:20:32	1.201	21.36	
09/13/93	14:40:32	1.189	21.03	
09/13/93	15:00:32	1.195	21.19	
09/13/93	15:20:32	1.201	21.36	
09/13/93	15:40:32	1.201	21.36	
09/13/93	16:00:32	1.195	21.19	
09/13/93	16:20:32	1.195	21.19	
09/13/93	16:40:32	1.213	21.70	
09/13/93	17:00:32	1.213	21.70	
09/13/93	17:20:32	1.254	22.87	
09/13/93	17:40:32	1.242	22.52	
09/13/93	18:00:32	1.248	22.70	
09/13/93	18:20:32	1.254	22.87	
09/13/93	18:40:32	1.230	22.18	
09/13/93	19:00:32	1.225	22.04	
09/13/93	19:20:32	1.219	21.87	
09/13/93	19:40:32	1.213	21.70	
09/13/93	20:00:32	1.213	21.70	
09/13/93	20:20:32	1.219	21.87	
09/13/93	20:40:32	1.207	21.53	
09/13/93	21:00:32	1.195	21.19	
09/13/93	21:20:32	1.195	21.19	
09/13/93	21:40:32	1.189	21.03	
09/13/93	22:00:32	1.195	21.19	
09/13/93	22:20:32	1.195	21.19	
09/13/93	22:40:32	1.183	20.86	
09/13/93	23:00:32	1.201	21.36	
09/13/93	23:20:32	1.195	21.19	
09/13/93	23:40:32	1.195	21.19	
<b>09/14/93</b>	<b>00:00:32</b>	<b>1.195</b>	<b>21.19</b>	<b>22.7</b>
09/14/93	00:20:32	1.183	20.86	
09/14/93	00:40:32	1.183	20.86	
09/14/93	01:00:32	1.178	20.72	
09/14/93	01:20:32	1.183	20.86	
09/14/93	01:40:32	1.201	21.36	
09/14/93	02:00:32	1.201	21.36	

DATE	TIME	STAGE (datalogger) (ft)	COMPUTED DISCHARGE (cfs)	COMPUTED
				MEAN DAILY DISCHARGE (cfs)
09/14/93	02:20:32	1.201	21.36	
09/14/93	02:40:32	1.195	21.19	
09/14/93	03:00:32	1.189	21.03	
09/14/93	03:20:32	1.195	21.19	
09/14/93	03:40:32	1.195	21.19	
09/14/93	04:00:32	1.195	21.19	
09/14/93	04:20:32	1.201	21.36	
09/14/93	04:40:32	1.183	20.86	
09/14/93	05:00:32	1.183	20.86	
09/14/93	05:20:32	1.189	21.03	
09/14/93	05:40:32	1.201	21.36	
09/14/93	06:00:32	1.195	21.19	
09/14/93	06:20:32	1.189	21.03	
09/14/93	06:40:32	1.189	21.03	
09/14/93	07:00:32	1.189	21.03	
09/14/93	07:20:32	1.189	21.03	
09/14/93	07:40:32	1.189	21.03	
09/14/93	08:00:32	1.183	20.86	
09/14/93	08:20:32	1.172	20.55	
09/14/93	08:40:32	1.148	19.89	
09/14/93	09:00:32	1.131	19.43	
09/14/93	09:20:32	1.078	18.01	
09/14/93	09:40:32	1.084	18.17	
09/14/93	10:00:32	1.101	18.62	
09/14/93	10:20:32	1.119	19.11	
09/14/93	10:40:32	1.113	18.94	
09/14/93	11:00:32	1.125	19.27	
09/14/93	11:20:32	1.136	19.57	
09/14/93	11:40:32	1.131	19.43	
09/14/93	12:00:32	1.148	19.89	
09/14/93	12:20:32	1.148	19.89	
09/14/93	12:40:32	1.148	19.89	
09/14/93	13:00:32	1.154	20.06	
09/14/93	13:20:32	1.166	20.39	
09/14/93	13:40:32	1.166	20.39	
09/14/93	14:00:32	1.172	20.55	
09/14/93	14:20:32	1.172	20.55	
09/14/93	14:40:32	1.178	20.72	
09/14/93	15:00:32	1.183	20.86	
09/14/93	15:20:32	1.183	20.86	
09/14/93	15:40:32	1.213	21.70	
09/14/93	16:00:32	1.360	25.99	
09/14/93	16:20:32	1.354	25.81	
09/14/93	16:40:32	1.366	26.17	

DATE	TIME	STAGE (datalogger) (ft)	COMPUTED DISCHARGE (cfs)	COMPUTED
				MEAN DAILY DISCHARGE (cfs)
09/14/93	17:00:32	1.383	26.69	
09/14/93	17:20:32	1.430	28.13	
09/14/93	17:40:32	1.442	28.51	
09/14/93	18:00:32	1.442	28.51	
09/14/93	18:20:32	1.430	28.13	
09/14/93	18:40:32	1.419	27.79	
09/14/93	19:00:32	1.424	27.95	
09/14/93	19:20:32	1.424	27.95	
09/14/93	19:40:32	1.413	27.61	
09/14/93	20:00:32	1.413	27.61	
09/14/93	20:20:32	1.407	27.42	
09/14/93	20:40:32	1.395	27.05	
09/14/93	21:00:32	1.383	26.69	
09/14/93	21:20:32	1.395	27.05	
09/14/93	21:40:32	1.389	26.87	
09/14/93	22:00:32	1.395	27.05	
09/14/93	22:20:32	1.372	26.35	
09/14/93	22:40:32	1.383	26.69	
09/14/93	23:00:32	1.372	26.35	
09/14/93	23:20:32	1.383	26.69	
09/14/93	23:40:32	1.372	26.35	
<b>09/15/93</b>	<b>00:00:32</b>	<b>1.377</b>	<b>26.51</b>	<b>27.5</b>
09/15/93	00:20:32	1.372	26.35	
09/15/93	00:40:32	1.383	26.69	
09/15/93	01:00:32	1.360	25.99	
09/15/93	01:20:32	1.366	26.17	
09/15/93	01:40:32	1.366	26.17	
09/15/93	02:00:32	1.366	26.17	
09/15/93	02:20:32	1.366	26.17	
09/15/93	02:40:32	1.372	26.35	
09/15/93	03:00:32	1.372	26.35	
09/15/93	03:20:32	1.372	26.35	
09/15/93	03:40:32	1.366	26.17	
09/15/93	04:00:32	1.366	26.17	
09/15/93	04:20:32	1.360	25.99	
09/15/93	04:40:32	1.366	26.17	
09/15/93	05:00:32	1.354	25.81	
09/15/93	05:20:32	1.366	26.17	
09/15/93	05:40:32	1.360	25.99	
09/15/93	06:00:32	1.360	25.99	
09/15/93	06:20:32	1.372	26.35	
09/15/93	06:40:32	1.372	26.35	
09/15/93	07:00:32	1.360	25.99	



DATE	TIME	STAGE (datalogger) (ft)	COMPUTED DISCHARGE (cfs)	COMPUTED
				MEAN DAILY DISCHARGE (cfs)
09/15/93	07:20:32	1.360	25.99	
09/15/93	07:40:32	1.360	25.99	
09/15/93	08:00:32	1.348	25.63	
09/15/93	08:20:32	1.342	25.45	
09/15/93	08:40:32	1.336	25.27	
09/15/93	09:00:32	1.313	24.59	
09/15/93	09:20:32	1.260	23.04	
09/15/93	09:40:32	1.248	22.70	
09/15/93	10:00:32	1.272	23.39	
09/15/93	10:20:32	1.319	24.77	
09/15/93	10:40:32	1.342	25.45	
09/15/93	11:00:32	1.325	24.94	
09/15/93	11:20:32	1.301	24.23	
09/15/93	11:40:32	1.336	25.27	
09/15/93	12:00:32	1.360	25.99	
09/15/93	12:20:32	1.360	25.99	
09/15/93	12:40:32	1.336	25.27	
09/15/93	13:00:32	1.336	25.27	
09/15/93	13:20:32	1.354	25.81	
09/15/93	13:40:32	1.342	25.45	
09/15/93	14:00:32	1.342	25.45	
09/15/93	14:20:32	1.336	25.27	
09/15/93	14:40:32	1.325	24.94	
09/15/93	15:00:32	1.372	26.35	
09/15/93	15:20:32	1.483	29.80	
09/15/93	15:40:32	1.495	30.18	
09/15/93	16:00:32	1.472	29.45	
09/15/93	16:20:32	1.495	30.18	
09/15/93	16:40:32	1.472	29.45	
09/15/93	17:00:32	1.501	30.37	
09/15/93	17:20:32	1.524	31.11	
09/15/93	17:40:32	1.536	31.49	
09/15/93	18:00:32	1.542	31.69	
09/15/93	18:20:32	1.530	31.30	
09/15/93	18:40:32	1.536	31.49	
09/15/93	19:00:32	1.536	31.49	
09/15/93	19:20:32	1.536	31.49	
09/15/93	19:40:32	1.542	31.69	
09/15/93	20:00:32	1.530	31.30	
09/15/93	20:20:32	1.530	31.30	
09/15/93	20:40:32	1.519	30.95	
09/15/93	21:00:32	1.513	30.75	



DATE	TIME	STAGE (datalogger) (ft)	COMPUTED DISCHARGE (cfs)	COMPUTED
				MEAN DAILY DISCHARGE (cfs)
09/15/93	21:20:32	1.513	30.75	
09/15/93	21:40:32	1.507	30.56	
09/15/93	22:00:32	1.507	30.56	
09/15/93	22:20:32	1.501	30.37	
09/15/93	22:40:32	1.501	30.37	
09/15/93	23:00:32	1.507	30.56	
09/15/93	23:20:32	1.495	30.18	
09/15/93	23:40:32	1.495	30.18	
<b>09/16/93</b>	<b>00:00:32</b>	<b>1.489</b>	<b>29.99</b>	<b>31.8</b>
09/16/93	00:20:32	1.489	29.99	
09/16/93	00:40:32	1.483	29.80	
09/16/93	01:00:32	1.483	29.80	
09/16/93	01:20:32	1.483	29.80	
09/16/93	01:40:32	1.495	30.18	
09/16/93	02:00:32	1.501	30.37	
09/16/93	02:20:32	1.501	30.37	
09/16/93	02:40:32	1.495	30.18	
09/16/93	03:00:32	1.489	29.99	
09/16/93	03:20:32	1.489	29.99	
09/16/93	03:40:32	1.489	29.99	
09/16/93	04:00:32	1.489	29.99	
09/16/93	04:20:32	1.483	29.80	
09/16/93	04:40:32	1.483	29.80	
09/16/93	05:00:32	1.477	29.61	
09/16/93	05:20:32	1.495	30.18	
09/16/93	05:40:32	1.483	29.80	
09/16/93	06:00:32	1.483	29.80	
09/16/93	06:20:32	1.477	29.61	
09/16/93	06:40:32	1.477	29.61	
09/16/93	07:00:32	1.489	29.99	
09/16/93	07:20:32	1.483	29.80	
09/16/93	07:40:32	1.489	29.99	
09/16/93	08:00:32	1.489	29.99	
09/16/93	08:20:32	1.466	29.26	
09/16/93	08:40:32	1.466	29.26	
09/16/93	09:00:32	1.460	29.07	
09/16/93	09:20:32	1.460	29.07	
09/16/93	09:40:32	1.454	28.88	
09/16/93	10:00:32	1.436	28.32	
09/16/93	10:20:32	1.413	27.61	

DATE	TIME	STAGE (datalogger) (ft)	COMPUTED DISCHARGE (cfs)	COMPUTED
				MEAN DAILY DISCHARGE (cfs)
09/16/93	10:40:32	1.419	27.79	
09/16/93	11:00:32	1.442	28.51	
09/16/93	11:20:32	1.460	29.07	
09/16/93	11:40:32	1.495	30.18	
09/16/93	12:00:32	1.472	29.45	
09/16/93	12:20:32	1.472	29.45	
09/16/93	12:40:32	1.424	27.95	
09/16/93	13:00:32	1.424	27.95	
09/16/93	13:20:32	1.448	28.69	
09/16/93	13:40:32	1.472	29.45	
09/16/93	14:00:32	1.466	29.26	
09/16/93	14:20:32	1.466	29.26	
09/16/93	14:40:32	1.477	29.61	
09/16/93	15:00:32	1.477	29.61	
09/16/93	15:20:32	1.472	29.45	
09/16/93	15:40:32	1.536	31.49	
09/16/93	16:00:32	1.636	34.79	
09/16/93	16:20:32	1.642	34.99	
09/16/93	16:40:32	1.654	35.39	
09/16/93	17:00:32	1.666	35.80	
09/16/93	17:20:32	1.718	37.58	
09/16/93	17:40:32	1.730	37.99	
09/16/93	18:00:32	1.730	37.99	
09/16/93	18:20:32	1.718	37.58	
09/16/93	18:40:32	1.701	36.99	
09/16/93	19:00:32	1.701	36.99	
09/16/93	19:20:32	1.701	36.99	
09/16/93	19:40:32	1.689	36.58	
09/16/93	20:00:32	1.689	36.58	
09/16/93	20:20:32	1.689	36.58	
09/16/93	20:40:32	1.683	36.38	
09/16/93	21:00:32	1.677	36.17	
09/16/93	21:20:32	1.671	35.97	
09/16/93	21:40:32	1.671	35.97	
09/16/93	22:00:32	1.671	35.97	
09/16/93	22:20:32	1.666	35.80	
09/16/93	22:40:32	1.660	35.60	
09/16/93	23:00:32	1.660	35.60	
09/16/93	23:20:32	1.654	35.39	

DATE	TIME	STAGE (datalogger) (ft)	COMPUTED DISCHARGE (cfs)	COMPUTED
				MEAN DAILY DISCHARGE (cfs)
09/16/93	23:40:32	1.642	34.99	
<b>09/17/93</b>	<b>00:00:32</b>	<b>1.642</b>	<b>34.99</b>	<b>23.5</b>
09/17/93	00:20:32	1.642	34.99	
09/17/93	00:40:32	1.636	34.79	
09/17/93	01:00:32	1.642	34.99	
09/17/93	01:20:32	1.648	35.19	
09/17/93	01:40:32	1.648	35.19	
09/17/93	02:00:32	1.642	34.99	
09/17/93	02:20:32	1.636	34.79	
09/17/93	02:40:32	1.630	34.59	
09/17/93	03:00:32	1.642	34.99	
09/17/93	03:20:32	1.648	35.19	
09/17/93	03:40:32	1.648	35.19	
09/17/93	04:00:32	1.648	35.19	
09/17/93	04:20:32	1.648	35.19	
09/17/93	04:40:32	1.642	34.99	
09/17/93	05:00:32	1.642	34.99	
09/17/93	05:20:32	1.648	35.19	
09/17/93	05:40:32	1.648	35.19	
09/17/93	06:00:32	1.660	35.60	
09/17/93	06:20:32	1.648	35.19	
09/17/93	06:40:32	1.642	34.99	
09/17/93	07:00:32	1.642	34.99	
09/17/93	07:20:32	1.642	34.99	
09/17/93	07:40:32	1.630	34.59	
09/17/93	08:00:32	1.642	34.99	
09/17/93	08:20:32	1.630	34.59	
09/17/93	08:40:32	1.624	34.39	
09/17/93	09:00:32	1.642	34.99	
09/17/93	09:20:32	1.630	34.59	
09/17/93	09:40:32	1.577	32.83	
09/17/93	10:00:32	1.618	34.19	
09/17/93	10:20:32	1.607	33.82	
09/17/93	10:40:32	1.566	32.47	
09/17/93	11:00:32	1.571	32.63	
09/17/93	11:20:32	1.560	32.27	
09/17/93	11:40:32	1.607	33.82	
09/17/93	12:00:32	1.613	34.02	
09/17/93	12:20:32	1.630	34.59	
09/17/93	12:40:32	1.648	35.19	
09/17/93	13:00:32	1.666	35.80	
09/17/93	13:20:32	1.666	35.80	
09/17/93	13:40:32	1.624	34.39	

DATE	TIME	STAGE (datalogger) (ft)	COMPUTED DISCHARGE (cfs)	COMPUTED
				MEAN DAILY DISCHARGE (cfs)
09/17/93	14:00:32	1.636	34.79	
09/17/93	14:20:32	1.636	34.79	
09/17/93	14:40:32	1.636	34.79	
09/17/93	15:00:32	1.636	34.79	
09/17/93	15:20:32	1.630	34.59	
09/17/93	15:40:32	1.624	34.39	
09/17/93	16:00:32	0.360	3.19	
09/17/93	16:20:32	0.178	1.05	
09/17/93	16:40:32	0.166	0.94	
09/17/93	17:00:32	0.178	1.05	
09/17/93	17:20:32	0.202	1.28	
09/17/93	17:40:32	0.172	1.00	
09/17/93	18:00:32	0.178	1.05	
09/17/93	18:20:32	0.172	1.00	
09/17/93	18:40:32	0.166	0.94	
09/17/93	19:00:32	0.166	0.94	
09/17/93	19:20:32	0.172	1.00	
09/17/93	19:40:32	0.166	0.94	
09/17/93	20:00:32	0.166	0.94	
09/17/93	20:20:32	0.166	0.94	
09/17/93	20:40:32	0.166	0.94	
09/17/93	21:00:32	0.166	0.94	
09/17/93	21:20:32	0.166	0.94	
09/17/93	21:40:32	0.166	0.94	
09/17/93	22:00:32	0.166	0.94	
09/17/93	22:20:32	0.166	0.94	
09/17/93	22:40:32	0.166	0.94	
09/17/93	23:00:32	0.166	0.94	
09/17/93	23:20:32	0.166	0.94	
09/17/93	23:40:32	0.166	0.94	
<b>09/18/93</b>	<b>00:00:32</b>	<b>0.166</b>	<b>0.94</b>	<b>1.0</b>
09/18/93	02:00:32	0.166	0.94	
09/18/93	04:00:32	0.166	0.94	
09/18/93	06:00:32	0.166	0.94	
09/18/93	08:00:32	0.166	0.94	
09/18/93	10:00:32	0.166	0.94	
09/18/93	12:00:32	0.166	0.94	
09/18/93	14:00:32	0.173	1.00	
09/18/93	16:00:32	0.168	0.96	
09/18/93	18:00:32	0.172	1.00	
09/18/93	20:00:32	0.166	0.94	
09/18/93	22:00:32	0.166	0.94	

Note: 09/18/93 meas. were 2-h average, from J. Olds 09/07/93 letter.

## **APPENDIX C**





**KOLOB STUDY SITE**  
**COMPUTED DISCHARGE & MEAN DAILY DISCHARGE**  
**SEPTEMBER 7 - 18, 1993**

<b>DATE</b>	<b>TIME</b>	<b>STAGE (datalogger) (ft)</b>	<b>COMPUTED DISCHARGE (cfs)</b>	<b>COMPUTED MEAN DAILY DISCHARGE (cfs)</b>
09/07	00:00	-6.13	0.0	
09/07	00:15	-6.13	0.0	
09/07	00:30	-6.13	0.0	
09/07	00:45	-6.13	0.0	
09/07	01:00	-6.13	0.0	
09/07	01:15	-6.13	0.0	
09/07	01:30	-6.13	0.0	
09/07	01:45	-6.13	0.0	
09/07	02:00	-6.13	0.0	
09/07	02:15	-6.13	0.0	
09/07	02:30	-6.13	0.0	
09/07	02:45	-5.89	0.01	
09/07	03:00	-5.88	0.15	
09/07	03:15	-5.89	0.06	
09/07	03:30	-5.89	0.08	
09/07	03:45	-5.88	0.12	
09/07	04:00	-5.88	0.10	
09/07	04:15	-5.88	0.12	
09/07	04:30	-5.88	0.18	
09/07	04:45	-5.88	0.15	
09/07	05:00	-5.88	0.15	
09/07	05:15	-5.88	0.18	
09/07	05:30	-5.88	0.18	
09/07	05:45	-5.87	0.20	
09/07	06:00	-5.87	0.20	
09/07	06:15	-5.87	0.20	
09/07	06:30	-5.87	0.20	
09/07	06:45	-5.87	0.20	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE (cfs)
09/07	07:00	-5.87	0.23	
09/07	07:15	-5.87	0.20	
09/07	07:30	-5.87	0.20	
09/07	07:45	-5.87	0.20	
09/07	08:00	-5.87	0.20	
09/07	08:15	-5.87	0.20	
09/07	08:30	-5.87	0.20	
09/07	08:45	-5.87	0.23	
09/07	09:00	-5.87	0.26	
09/07	09:15	-5.87	0.26	
09/07	09:30	-5.87	0.30	
09/07	09:45	-5.87	0.30	
09/07	10:00	-5.87	0.30	
09/07	10:15	-5.86	0.33	
09/07	10:30	-5.86	0.40	
09/07	10:45	-5.86	0.37	
09/07	11:00	-5.86	0.40	
09/07	11:15	-5.86	0.40	
09/07	11:30	-5.85	0.48	
09/07	11:45	-5.86	0.44	
09/07	12:00	-5.85	0.48	
09/07	12:15	-5.85	0.52	
09/07	12:30	-5.85	0.56	
09/07	12:45	-5.85	0.56	
09/07	13:00	-5.84	0.65	
09/07	13:15	-5.84	0.74	
09/07	13:30	-5.84	0.83	
09/07	13:45	-5.84	0.78	
09/07	14:00	-5.84	0.83	
09/07	14:15	-5.84	0.69	
09/07	14:30	-5.84	0.69	
09/07	14:45	-5.84	0.65	
09/07	15:00	-5.84	0.69	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/07	15:15	-5.84	0.65	
09/07	15:30	-5.84	0.65	
09/07	15:45	-5.84	0.69	
09/07	16:00	-5.84	0.78	
09/07	16:15	-5.84	0.78	
09/07	16:30	-5.84	0.78	
09/07	16:45	-5.84	0.78	
09/07	17:00	-5.84	0.83	
09/07	17:15	-5.84	0.83	
09/07	17:30	-5.84	0.78	
09/07	17:45	-5.84	0.78	
09/07	18:00	-5.84	0.83	
09/07	18:15	-5.84	0.83	
09/07	18:30	-5.84	0.78	
09/07	18:45	-5.84	0.83	
09/07	19:00	-5.84	0.78	
09/07	19:15	-5.84	0.78	
09/07	19:30	-5.84	0.78	
09/07	19:45	-5.84	0.78	
09/07	20:00	-5.84	0.74	
09/07	20:15	-5.84	0.74	
09/07	20:30	-5.84	0.78	
09/07	20:45	-5.84	0.78	
09/07	21:00	-5.84	0.74	
09/07	21:15	-5.84	0.69	
09/07	21:30	-5.84	0.65	
09/07	21:45	-5.84	0.69	
09/07	22:00	-5.85	0.60	
09/07	22:15	-5.84	0.69	
09/07	22:30	-5.85	0.60	
09/07	22:45	-5.85	0.60	
09/07	23:00	-5.85	0.52	
09/07	23:15	-5.85	0.60	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/07	23:30	-5.85	0.52	
09/07	23:45	-5.85	0.56	0.44
09/08	00:00	-5.85	0.56	
09/08	00:15	-5.86	0.44	
09/08	00:30	-5.85	0.48	
09/08	00:45	-5.86	0.44	
09/08	01:00	-5.85	0.56	
09/08	01:15	-5.82	1.25	
09/08	01:30	-5.81	1.31	
09/08	01:45	-5.82	1.25	
09/08	02:00	-5.82	1.14	
09/08	02:15	-5.83	1.03	
09/08	02:30	-5.83	1.03	
09/08	02:45	-5.83	0.93	
09/08	03:00	-5.83	0.93	
09/08	03:15	-5.84	0.78	
09/08	03:30	-5.84	0.78	
09/08	03:45	-5.84	0.74	
09/08	04:00	-5.84	0.65	
09/08	04:15	-5.84	0.65	
09/08	04:30	-5.85	0.60	
09/08	04:45	-5.85	0.52	
09/08	05:00	-5.85	0.52	
09/08	05:15	-5.85	0.48	
09/08	05:30	-5.85	0.48	
09/08	05:45	-5.86	0.44	
09/08	06:00	-5.86	0.40	
09/08	06:15	-5.86	0.40	
09/08	06:30	-5.86	0.37	
09/08	06:45	-5.86	0.37	
09/08	07:00	-5.86	0.37	
09/08	07:15	-5.86	0.37	
09/08	07:30	-5.86	0.33	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
09/08	07:45	-5.86	0.33	
09/08	08:00	-5.86	0.37	
09/08	08:15	-5.86	0.37	
09/08	08:30	-5.86	0.40	
09/08	08:45	-5.86	0.40	
09/08	09:00	-5.86	0.40	
09/08	09:15	-5.86	0.44	
09/08	09:30	-5.85	0.48	
09/08	09:45	-5.85	0.48	
09/08	10:00	-5.85	0.48	
09/08	10:15	-5.85	0.52	
09/08	10:30	-5.85	0.56	
09/08	10:45	-5.85	0.56	
09/08	11:00	-5.85	0.56	
09/08	11:15	-5.85	0.60	
09/08	11:30	-5.85	0.60	
09/08	11:45	-5.84	0.65	
09/08	12:00	-5.84	0.65	
09/08	12:15	-5.84	0.69	
09/08	12:30	-5.84	0.69	
09/08	12:45	-5.84	0.74	
09/08	13:00	-5.84	0.78	
09/08	13:15	-5.84	0.83	
09/08	13:30	-5.84	0.83	
09/08	13:45	-5.83	0.88	
09/08	14:00	-5.83	0.93	
09/08	14:15	-5.84	0.83	
09/08	14:30	-5.84	0.83	
09/08	14:45	-5.84	0.83	
09/08	15:00	-5.84	0.78	
09/08	15:15	-5.84	0.83	
09/08	15:30	-5.83	0.88	
09/08	15:45	-5.84	0.83	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/08	16:00	-5.83	0.88	
09/08	16:15	-5.83	0.88	
09/08	16:30	-5.83	0.88	
09/08	16:45	-5.84	0.83	
09/08	17:00	-5.83	0.93	
09/08	17:15	-5.83	0.88	
09/08	17:30	-5.83	1.03	
09/08	17:45	-5.83	1.03	
09/08	18:00	-5.82	1.09	
09/08	18:15	-5.83	0.88	
09/08	18:30	DATA		
09/08	18:45	MAINTENANCE		
09/08	19:00	-5.83	0.94	
09/08	19:15	-5.83	0.94	
09/08	19:30	-5.83	0.94	
09/08	19:45	-5.67	6.24	
09/08	20:00	-5.74	3.50	
09/08	20:15	-5.74	3.50	
09/08	20:30	-5.74	3.50	
09/08	20:45	-5.74	3.50	
09/08	21:00	-5.74	3.50	
09/08	21:15	-5.74	3.50	
09/08	21:30	-5.74	3.50	
09/08	21:45	-5.73	3.86	
09/08	22:00	-5.73	3.86	
09/08	22:15	-5.73	3.86	
09/08	22:30	-5.74	3.50	
09/08	22:45	-5.74	3.50	
09/08	23:00	-5.73	3.86	
09/08	23:15	-5.73	3.86	
09/08	23:30	-5.73	3.86	
09/08	23:45	-5.73	3.86	1.3
09/09	00:00	-5.73	3.86	
09/09	00:15	-5.73	3.86	



DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/09	00:30	-5.73	3.86	
09/09	00:45	-5.73	3.86	
09/09	01:00	-5.73	3.86	
09/09	01:15	-5.73	3.86	
09/09	01:30	-5.73	3.86	
09/09	01:45	-5.73	3.86	
09/09	02:00	-5.73	3.86	
09/09	02:15	-5.73	3.86	
09/09	02:30	-5.73	3.86	
09/09	02:45	-5.72	4.23	
09/09	03:00	-5.72	4.23	
09/09	03:15	-5.72	4.23	
09/09	03:30	-5.73	3.86	
09/09	03:45	-5.73	3.86	
09/09	04:00	-5.73	3.86	
09/09	04:15	-5.73	3.86	
09/09	04:30	-5.72	4.23	
09/09	04:45	-5.72	4.23	
09/09	05:00	-5.72	4.23	
09/09	05:15	-5.72	4.23	
09/09	05:30	-5.72	4.23	
09/09	05:45	-5.72	4.23	
09/09	06:00	-5.72	4.23	
09/09	06:15	-5.72	4.23	
09/09	06:30	-5.72	4.23	
09/09	06:45	-5.71	4.60	
09/09	07:00	-5.72	4.23	
09/09	07:15	-5.72	4.23	
09/09	07:30	-5.72	4.23	
09/09	07:45	-5.72	4.23	
09/09	08:00	-5.72	4.23	
09/09	08:15	-5.72	4.23	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/09	08:30	-5.71	4.60	
09/09	08:45	-5.71	4.60	
09/09	09:00	-5.71	4.60	
09/09	09:15	-5.71	4.60	
09/09	09:30	DATA MAINTENANCE*		
09/09	09:45	-5.66	6.68	
09/09	10:00	-5.66	6.68	
09/09	10:15	-5.66	6.68	
09/09	10:30	-5.66	6.68	
09/09	10:45	-5.66	6.68	
09/09	11:00	-5.66	6.68	
09/09	11:15	-5.67	6.24	
09/09	11:30	-5.65	7.12	
09/09	11:45	-5.66	6.68	
09/09	12:00	-5.66	6.68	
09/09	12:15	-5.66	6.68	
09/09	12:30	-5.66	6.68	
09/09	12:45	-5.66	6.68	
09/09	13:00	-5.66	6.68	
09/09	13:15	-5.66	6.68	
09/09	13:30	-5.66	6.68	
09/09	13:45	-5.66	6.68	
09/09	14:00	-5.66	6.68	
09/09	14:15	-5.66	6.68	
09/09	14:30	-5.66	6.68	
09/09	14:45	-5.66	6.68	
09/09	15:00	-5.66	6.68	
09/09	15:15	-5.66	6.68	
09/09	15:30	-5.66	6.68	
09/09	15:45	-5.66	6.68	
09/09	16:00	-5.66	6.68	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/09	16:15	-5.67	6.24	
09/09	16:30	-5.67	6.24	
09/09	16:45	-5.67	6.24	
09/09	17:00	-5.66	6.68	
09/09	17:15	-5.67	6.24	
09/09	17:30	-5.67	6.24	
09/09	17:45	-5.67	6.24	
09/09	18:00	-5.68	5.81	
09/09	18:15	-5.68	5.81	
09/09	18:30	-5.68	5.81	
09/09	18:45	-5.67	6.24	
09/09	19:00	-5.68	5.81	
09/09	19:15	-5.68	5.81	
09/09	19:30	-5.68	5.81	
09/09	19:45	-5.68	5.81	
09/09	20:00	-5.68	5.81	
09/09	20:15	-5.68	5.81	
09/09	20:30	-5.68	5.81	
09/09	20:45	-5.68	5.81	
09/09	21:00	-5.68	5.81	
09/09	21:15	-5.68	5.81	
09/09	21:30	-5.67	6.24	
09/09	21:45	-5.68	5.81	
09/09	22:00	-5.68	5.81	
09/09	22:15	-5.67	6.24	
09/09	22:30	-5.69	5.40	
09/09	22:45	-5.68	5.81	
09/09	23:00	-5.68	5.81	
09/09	23:15	-5.69	5.40	
09/09	23:30	-5.69	5.40	
09/09	23:45	-5.68	5.81	5.4
09/10	00:00	-5.68	5.81	
09/10	00:15	-5.68	5.81	
09/10	00:30	-5.68	5.81	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/10	00:45	-5.68	5.81	
09/10	01:00	-5.68	5.81	
09/10	01:15	-5.68	5.81	
09/10	01:30	-5.68	5.81	
09/10	01:45	-5.69	5.40	
09/10	02:00	-5.69	5.40	
09/10	02:15	-5.68	5.81	
09/10	02:30	-5.68	5.81	
09/10	02:45	-5.68	5.81	
09/10	03:00	-5.69	5.40	
09/10	03:15	-5.69	5.40	
09/10	03:30	-5.69	5.40	
09/10	03:45	-5.69	5.40	
09/10	04:00	-5.69	5.40	
09/10	04:15	-5.69	5.40	
09/10	04:30	-5.68	5.81	
09/10	04:45	-5.69	5.40	
09/10	05:00	-5.69	5.40	
09/10	05:15	-5.70	5.00	
09/10	05:30	-5.68	5.81	
09/10	05:45	-5.69	5.40	
09/10	06:00	-5.68	5.81	
09/10	06:15	-5.69	5.40	
09/10	06:30	-5.68	5.81	
09/10	06:45	-5.69	5.40	
09/10	07:00	-5.69	5.40	
09/10	07:15	-5.69	5.40	
09/10	07:30	-5.68	5.81	
09/10	07:45	-5.69	5.40	
09/10	08:00	-5.68	5.81	
09/10	08:15	-5.69	5.40	
09/10	08:30	-5.68	5.81	
09/10	08:45	-5.69	5.40	
09/10	09:00	-5.68	5.81	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/10	09:15	-5.69	5.40	
09/10	09:30	-5.68	5.81	
09/10	09:45	-5.68	5.81	
09/10	10:00	-5.68	5.81	
09/10	10:15	-5.68	5.81	
09/10	10:30	-5.69	5.40	
09/10	10:45	-5.68	5.81	
09/10	11:00	-5.69	5.40	
09/10	11:15	-5.67	6.24	
09/10	11:30	-5.68	5.81	
09/10	11:45	-5.68	5.81	
09/10	12:00	-5.68	5.81	
09/10	12:15	-5.68	5.81	
09/10	12:30	-5.68	5.81	
09/10	12:45	-5.68	5.81	
09/10	13:00	-5.68	5.81	
09/10	13:15	-5.68	5.81	
09/10	13:30	-5.68	5.81	
09/10	13:45	-5.68	5.81	
09/10	14:00	-5.68	5.81	
09/10	14:15	-5.68	5.81	
09/10	14:30	-5.68	5.81	
09/10	14:45	-5.68	5.81	
09/10	15:00	-5.68	5.81	
09/10	15:15	-5.68	5.81	
09/10	15:30	-5.68	5.81	
09/10	15:45	-5.68	5.81	
09/10	16:00	-5.68	5.81	
09/10	16:15	-5.69	5.40	
09/10	16:30	-5.69	5.40	
09/10	16:45	-5.69	5.40	
09/10	17:00	-5.68	5.81	
09/10	17:15	-5.68	5.81	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/10	17:30	-5.69	5.40	
09/10	17:45	-5.69	5.40	
09/10	18:00	-5.69	5.40	
09/10	18:15	-5.69	5.40	
09/10	18:30	-5.69	5.40	
09/10	18:45	-5.68	5.81	
09/10	19:00	-5.69	5.40	
09/10	19:15	-5.69	5.40	
09/10	19:30	-5.68	5.81	
09/10	19:45	-5.69	5.40	
09/10	20:00	-5.69	5.40	
09/10	20:15	-5.69	5.40	
09/10	20:30	-5.69	5.40	
09/10	20:45	-5.69	5.40	
09/10	21:00	-5.69	5.40	
09/10	21:15	-5.69	5.40	
09/10	21:30	-5.69	5.40	
09/10	21:45	-5.69	5.40	
09/10	22:00	-5.69	5.40	
09/10	22:15	-5.68	5.81	
09/10	22:30	-5.69	5.40	
09/10	22:45	-5.68	5.81	
09/10	23:00	-5.69	5.40	
09/10	23:15	-5.68	5.81	
09/10	23:30	-5.68	5.81	
09/10	23:45	-5.68	5.81	5.6
09/11	00:00	-5.61	9.02	
09/11	00:15	-5.59	10.03	
09/11	00:30	-5.61	9.02	
09/11	00:45	-5.60	9.52	
09/11	01:00	-5.60	9.52	
09/11	01:15	-5.58	10.55	
09/11	01:30	-5.59	10.03	



DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/11	01:45	-5.59	10.03	
09/11	02:00	-5.59	10.03	
09/11	02:15	-5.59	10.03	
09/11	02:30	-5.59	10.03	
09/11	02:45	-5.59	10.03	
09/11	03:00	-5.59	10.03	
09/11	03:15	-5.60	9.52	
09/11	03:30	-5.59	10.03	
09/11	03:45	-5.59	10.03	
09/11	04:00	-5.58	10.55	
09/11	04:15	-5.59	10.03	
09/11	04:30	-5.59	10.03	
09/11	04:45	-5.59	10.03	
09/11	05:00	-5.58	10.55	
09/11	05:15	-5.59	10.03	
09/11	05:30	-5.58	10.55	
09/11	05:45	-5.58	10.55	
09/11	06:00	-5.58	10.55	
09/11	06:15	-5.58	10.55	
09/11	06:30	-5.58	10.55	
09/11	06:45	-5.59	10.03	
09/11	07:00	-5.58	10.55	
09/11	07:15	-5.58	10.55	
09/11	07:30	-5.58	10.55	
09/11	07:45	-5.58	10.55	
09/11	08:00	-5.59	10.03	
09/11	08:15	-5.59	10.03	
09/11	08:30	-5.58	10.55	
09/11	08:45	-5.58	10.55	
09/11	09:00	-5.58	10.55	
09/11	09:15	-5.59	10.03	
09/11	09:30	-5.58	10.55	
09/11	09:45	-5.58	10.55	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/11	10:00	-5.58	10.55	
09/11	10:15	-5.57	11.08	
09/11	10:30	-5.58	10.55	
09/11	10:45	-5.58	10.55	
09/11	11:00	-5.57	11.08	
09/11	11:15	-5.58	10.55	
09/11	11:30	-5.57	11.08	
09/11	11:45	-5.58	10.55	
09/11	12:00	-5.57	11.08	
09/11	12:15	-5.58	10.55	
09/11	12:30	-5.58	10.55	
09/11	12:45	-5.58	10.55	
09/11	13:00	-5.58	10.55	
09/11	13:15	-5.58	10.55	
09/11	13:30	-5.58	10.55	
09/11	13:45	-5.57	11.08	
09/11	14:00	-5.57	11.08	
09/11	14:15	-5.58	10.55	
09/11	14:30	-5.59	10.03	
09/11	14:45	-5.58	10.55	
09/11	15:00	-5.58	10.55	
09/11	15:15	-5.58	10.55	
09/11	15:30	-5.58	10.55	
09/11	15:45	-5.58	10.55	
09/11	16:00	-5.58	10.55	
09/11	16:15	-5.58	10.55	
09/11	16:30	-5.58	10.55	
09/11	16:45	-5.58	10.55	
09/11	17:00	-5.59	10.03	
09/11	17:15	-5.58	10.55	
09/11	17:30	-5.58	10.55	
09/11	17:45	-5.59	10.03	
09/11	18:00	-5.58	10.55	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/11	18:15	-5.58	10.55	
09/11	18:30	-5.58	10.55	
09/11	18:45	-5.58	10.55	
09/11	19:00	-5.59	10.03	
09/11	19:15	-5.59	10.03	
09/11	19:30	-5.58	10.55	
09/11	19:45	-5.58	10.55	
09/11	20:00	-5.58	10.55	
09/11	20:15	-5.59	10.03	
09/11	20:30	-5.59	10.03	
09/11	20:45	-5.58	10.55	
09/11	21:00	-5.58	10.55	
09/11	21:15	-5.58	10.55	
09/11	21:30	-5.59	10.03	
09/11	21:45	-5.59	10.03	
09/11	22:00	-5.59	10.03	
09/11	22:15	-5.59	10.03	
09/11	22:30	-5.56	11.62	
09/11	22:45	-5.54	12.72	
09/11	23:00	-5.53	13.29	
09/11	23:15	-5.53	13.29	
09/11	23:30	-5.53	13.29	
09/11	23:45	-5.52	13.86	11
09/12	00:00	-5.52	13.86	
09/12	00:15	-5.52	13.86	
09/12	00:30	-5.51	14.45	
09/12	00:45	-5.51	14.45	
09/12	01:00	-5.51	14.45	
09/12	01:15	-5.51	14.45	
09/12	01:30	-5.50	15.04	
09/12	01:45	-5.51	14.45	
09/12	02:00	-5.52	13.86	
09/12	02:15	-5.50	15.04	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/12	02:30	-5.51	14.45	
09/12	02:45	-5.51	14.45	
09/12	03:00	-5.51	14.45	
09/12	03:15	-5.51	14.45	
09/12	03:30	-5.50	15.04	
09/12	03:45	-5.52	13.86	
09/12	04:00	-5.51	14.45	
09/12	04:15	-5.52	13.86	
09/12	04:30	-5.51	14.45	
09/12	04:45	-5.52	13.86	
09/12	05:00	-5.51	14.45	
09/12	05:15	-5.51	14.45	
09/12	05:30	-5.51	14.45	
09/12	05:45	-5.51	14.45	
09/12	06:00	-5.51	14.45	
09/12	06:15	-5.51	14.45	
09/12	06:30	-5.52	13.86	
09/12	06:45	-5.52	13.86	
09/12	07:00	-5.51	14.45	
09/12	07:15	-5.51	14.45	
09/12	07:30	-5.51	14.45	
09/12	07:45	-5.51	14.45	
09/12	08:00	-5.52	13.86	
09/12	08:15	-5.52	13.86	
09/12	08:30	-5.52	13.86	
09/12	08:45	-5.51	14.45	
09/12	09:00	-5.51	14.45	
09/12	09:15	-5.52	13.86	
09/12	09:30	-5.50	15.04	
09/12	09:45	-5.51	14.45	
09/12	10:00	-5.51	14.45	
09/12	10:15	-5.50	15.04	
09/12	10:30	-5.51	14.45	
09/12	10:45	-5.51	14.45	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/12	11:00	-5.51	14.45	
09/12	11:15	-5.50	15.04	
09/12	11:30	-5.51	14.45	
09/12	11:45	-5.51	14.45	
09/12	12:00	-5.52	13.86	
09/12	12:15	-5.50	15.04	
09/12	12:30	-5.51	14.45	
09/12	12:45	-5.52	13.86	
09/12	13:00	-5.49	15.64	
09/12	13:15	-5.50	15.04	
09/12	13:30	-5.51	14.45	
09/12	13:45	-5.51	14.45	
09/12	14:00	-5.50	15.04	
09/12	14:15	-5.51	14.45	
09/12	14:30	-5.51	14.45	
09/12	14:45	-5.52	13.86	
09/12	15:00	-5.51	14.45	
09/12	15:15	-5.50	15.04	
09/12	15:30	-5.50	15.04	
09/12	15:45	-5.50	15.04	
09/12	16:00	-5.51	14.45	
09/12	16:15	-5.51	14.45	
09/12	16:30	-5.50	15.04	
09/12	16:45	-5.51	14.45	
09/12	17:00	-5.51	14.45	
09/12	17:15	-5.52	13.86	
09/12	17:30	-5.52	13.86	
09/12	17:45	-5.51	14.45	
09/12	18:00	-5.51	14.45	
09/12	18:15	-5.50	15.04	
09/12	18:30	-5.52	13.86	
09/12	18:45	-5.51	14.45	
09/12	19:00	-5.51	14.45	
09/12	19:15	-5.51	14.45	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/12	19:30	-5.51	14.45	
09/12	19:45	-5.52	13.86	
09/12	20:00	-5.51	14.45	
09/12	20:15	-5.50	15.04	
09/12	20:30	-5.51	14.45	
09/12	20:45	-5.51	14.45	
09/12	21:00	-5.50	15.04	
09/12	21:15	-5.51	14.45	
09/12	21:30	-5.51	14.45	
09/12	21:45	-5.51	14.45	
09/12	22:00	-5.51	14.45	
09/12	22:15	-5.51	14.45	
09/12	22:30	-5.51	14.45	
09/12	22:45	-5.51	14.45	
09/12	23:00	-5.50	15.04	
09/12	23:15	-5.50	15.04	
09/12	23:30	-5.51	14.45	
09/12	23:45	-5.51	14.45	14
09/13	00:00	-5.50	15.04	
09/13	00:15	-5.50	15.04	
09/13	00:30	-5.51	14.45	
09/13	00:45	-5.49	15.64	
09/13	01:00	-5.50	15.04	
09/13	01:15	-5.50	15.04	
09/13	01:30	-5.50	15.04	
09/13	01:45	-5.52	13.86	
09/13	02:00	-5.50	15.04	
09/13	02:15	-5.50	15.04	
09/13	02:30	-5.50	15.04	
09/13	02:45	-5.49	15.64	
09/13	03:00	-5.50	15.04	
09/13	03:15	-5.50	15.04	
09/13	03:30	-5.50	15.04	
09/13	03:45	-5.51	14.45	
09/13	04:00	-5.50	15.04	



DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/13	04:15	-5.50	15.04	
09/13	04:30	-5.50	15.04	
09/13	04:45	-5.50	15.04	
09/13	05:00	-5.50	15.04	
09/13	05:15	-5.50	15.04	
09/13	05:30	-5.50	15.04	
09/13	05:45	-5.51	14.45	
09/13	06:00	-5.50	15.04	
09/13	06:15	-5.50	15.04	
09/13	06:30	-5.50	15.04	
09/13	06:45	-5.51	14.45	
09/13	07:00	-5.50	15.04	
09/13	07:15	-5.50	15.04	
09/13	07:30	-5.50	15.04	
09/13	07:45	-5.50	15.04	
09/13	08:00	-5.52	13.86	
09/13	08:15	-5.51	14.45	
09/13	08:30	-5.50	15.04	
09/13	08:45	-5.50	15.04	
09/13	09:00	-5.51	14.45	
09/13	09:15	-5.50	15.04	
09/13	09:30	-5.50	15.04	
09/13	09:45	-5.50	15.04	
09/13	10:00	-5.50	15.04	
09/13	10:15	-5.50	15.04	
09/13	10:30	-5.51	14.45	
09/13	10:45	-5.50	15.04	
09/13	11:00	-5.49	15.64	
09/13	11:15	-5.50	15.04	
09/13	11:30	-5.49	15.64	
09/13	11:45	-5.50	15.04	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/13	12:00	-5.50	15.04	
09/13	12:15	-5.51	14.45	
09/13	12:30	-5.50	15.04	
09/13	12:45	-5.50	15.04	
09/13	13:00	-5.49	15.64	
09/13	13:15	-5.49	15.64	
09/13	13:30	-5.49	15.64	
09/13	13:45	-5.49	15.64	
09/13	14:00	-5.49	15.64	
09/13	14:15	-5.50	15.04	
09/13	14:30	-5.49	15.64	
09/13	14:45	-5.49	15.64	
09/13	15:00	-5.50	15.04	
09/13	15:15	-5.50	15.04	
09/13	15:30	-5.50	15.04	
09/13	15:45	-5.50	15.04	
09/13	16:00	-5.50	15.04	
09/13	16:15	-5.49	15.64	
09/13	16:30	-5.49	15.64	
09/13	16:45	-5.50	15.04	
09/13	17:00	-5.49	15.64	
09/13	17:15	-5.50	15.04	
09/13	17:30	-5.50	15.04	
09/13	17:45	-5.50	15.04	
09/13	18:00	-5.50	15.04	
09/13	18:15	-5.50	15.04	
09/13	18:30	-5.49	15.64	
09/13	18:45	-5.49	15.64	
09/13	19:00	-5.49	15.64	
09/13	19:15	-5.50	15.04	
09/13	19:30	-5.50	15.04	
09/13	19:45	-5.49	15.64	
09/13	20:00	-5.50	15.04	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
09/13	20:15	-5.50	15.04	
09/13	20:30	-5.50	15.04	
09/13	20:45	-5.50	15.04	
09/13	21:00	-5.50	15.04	
09/13	21:15	-5.51	14.45	
09/13	21:30	-5.49	15.64	
09/13	21:45	-5.49	15.64	
09/13	22:00	-5.49	15.64	
09/13	22:15	-5.50	15.04	
09/13	22:30	-5.50	15.04	
09/13	22:45	-5.50	15.04	
09/13	23:00	-5.50	15.04	
09/13	23:15	-5.49	15.64	
09/13	23:30	-5.51	14.45	
09/13	23:45	-5.49	15.64	15
09/14	00:00	-5.49	15.64	
09/14	00:15	-5.50	15.04	
09/14	00:30	-5.49	15.64	
09/14	00:45	-5.49	15.64	
09/14	01:00	-5.50	15.04	
09/14	01:15	-5.50	15.04	
09/14	01:30	-5.49	15.64	
09/14	01:45	-5.49	15.64	
09/14	02:00	-5.49	15.64	
09/14	02:15	-5.50	15.04	
09/14	02:30	-5.49	15.64	
09/14	02:45	-5.50	15.04	
09/14	03:00	-5.49	15.64	
09/14	03:15	-5.49	15.64	
09/14	03:30	-5.50	15.04	
09/14	03:45	-5.49	15.64	
09/14	04:00	-5.49	15.64	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/14	04:15	-5.50	15.04	
09/14	04:30	-5.50	15.04	
09/14	04:45	-5.50	15.04	
09/14	05:00	-5.49	15.64	
09/14	05:15	-5.50	15.04	
09/14	05:30	-5.49	15.64	
09/14	05:45	-5.49	15.64	
09/14	06:00	-5.49	15.64	
09/14	06:15	-5.50	15.04	
09/14	06:30	-5.48	16.25	
09/14	06:45	-5.49	15.64	
09/14	07:00	-5.49	15.64	
09/14	07:15	-5.50	15.04	
09/14	07:30	-5.49	15.64	
09/14	07:45	-5.49	15.64	
09/14	08:00	-5.49	15.64	
09/14	08:15	-5.48	16.25	
09/14	08:30	-5.49	15.64	
09/14	08:45	-5.49	15.64	
09/14	09:00	-5.49	15.64	
09/14	09:15	-5.49	15.64	
09/14	09:30	-5.48	16.25	
09/14	09:45	-5.49	15.64	
09/14	10:00	-5.50	15.04	
09/14	10:15	-5.49	15.64	
09/14	10:30	-5.49	15.64	
09/14	10:45	-5.48	16.25	
09/14	11:00	-5.48	16.25	
09/14	11:15	-5.49	15.64	
09/14	11:30	-5.48	16.25	
09/14	11:45	-5.49	15.64	
09/14	12:00	-5.48	16.25	
09/14	12:15	-5.48	16.25	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/14	12:30	-5.48	16.25	
09/14	12:45	-5.49	15.64	
09/14	13:00	-5.49	15.64	
09/14	13:15	-5.49	15.64	
09/14	13:30	-5.49	15.64	
09/14	13:45	-5.49	15.64	
09/14	14:00	-5.49	15.64	
09/14	14:15	-5.49	15.64	
09/14	14:30	-5.49	15.64	
09/14	14:45	-5.49	15.64	
09/14	15:00	-5.49	15.64	
09/14	15:15	-5.50	15.04	
09/14	15:30	-5.49	15.64	
09/14	15:45	-5.49	15.64	
09/14	16:00	-5.49	15.64	
09/14	16:15	-5.49	15.64	
09/14	16:30	-5.49	15.64	
09/14	16:45	-5.49	15.64	
09/14	17:00	-5.50	15.04	
09/14	17:15	-5.49	15.64	
09/14	17:30	-5.49	15.64	
09/14	17:45	-5.49	15.64	
09/14	18:00	-5.48	16.25	
09/14	18:15	-5.49	15.64	
09/14	18:30	-5.49	15.64	
09/14	18:45	-5.49	15.64	
09/14	19:00	-5.49	15.64	
09/14	19:15	-5.49	15.64	
09/14	19:30	-5.49	15.64	
09/14	19:45	-5.48	16.25	
09/14	20:00	-5.48	16.25	
09/14	20:15	-5.49	15.64	
09/14	20:30	-5.49	15.64	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/14	20:45	-5.49	15.64	
09/14	21:00	-5.48	16.25	
09/14	21:15	-5.49	15.64	
09/14	21:30	-5.49	15.64	
09/14	21:45	-5.47	16.87	
09/14	22:00	-5.46	17.50	
09/14	22:15	-5.45	18.14	
09/14	22:30	-5.44	18.78	
09/14	22:45	-5.43	19.44	
09/14	23:00	-5.43	19.44	
09/14	23:15	-5.42	20.10	
09/14	23:30	-5.44	18.78	
09/14	23:45	-5.44	18.78	16
09/15	00:00	-5.43	19.44	
09/15	00:15	-5.43	19.44	
09/15	00:30	-5.43	19.44	
09/15	00:45	-5.43	19.44	
09/15	01:00	-5.43	19.44	
09/15	01:15	-5.42	20.10	
09/15	01:30	-5.42	20.10	
09/15	01:45	-5.42	20.10	
09/15	02:00	-5.44	18.78	
09/15	02:15	-5.44	18.78	
09/15	02:30	-5.43	19.44	
09/15	02:45	-5.43	19.44	
09/15	03:00	-5.43	19.44	
09/15	03:15	-5.43	19.44	
09/15	03:30	-5.42	20.10	
09/15	03:45	-5.44	18.78	
09/15	04:00	-5.43	19.44	
09/15	04:15	-5.43	19.44	



DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/15	04:30	-5.43	19.44	
09/15	04:45	-5.42	20.10	
09/15	05:00	-5.42	20.10	
09/15	05:15	-5.42	20.10	
09/15	05:30	-5.42	20.10	
09/15	05:45	-5.42	20.10	
09/15	06:00	-5.43	19.44	
09/15	06:15	-5.43	19.44	
09/15	06:30	-5.42	20.10	
09/15	06:45	-5.42	20.10	
09/15	07:00	-5.42	20.10	
09/15	07:15	-5.42	20.10	
09/15	07:30	-5.42	20.10	
09/15	07:45	-5.43	19.44	
09/15	08:00	-5.43	19.44	
09/15	08:15	-5.43	19.44	
09/15	08:30	-5.43	19.44	
09/15	08:45	-5.42	20.10	
09/15	09:00	-5.43	19.44	
09/15	09:15	-5.43	19.44	
09/15	09:30	-5.41	20.77	
09/15	09:45	-5.42	20.10	
09/15	10:00	-5.43	19.44	
09/15	10:15	-5.43	19.44	
09/15	10:30	-5.43	19.44	
09/15	10:45	-5.42	20.10	
09/15	11:00	-5.42	20.10	
09/15	11:15	-5.41	20.77	
09/15	11:30	-5.43	19.44	
09/15	11:45	-5.42	20.10	
09/15	12:00	-5.42	20.10	
09/15	12:15	-5.41	20.77	
09/15	12:30	-5.43	19.44	
09/15	12:45	-5.42	20.10	
09/15	13:00	-5.42	20.10	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/15	13:15	-5.43	19.44	
09/15	13:30	-5.42	20.10	
09/15	13:45	-5.43	19.44	
09/15	14:00	-5.41	20.77	
09/15	14:15	-5.43	19.44	
09/15	14:30	-5.43	19.44	
09/15	14:45	-5.41	20.77	
09/15	15:00	-5.43	19.44	
09/15	15:15	-5.42	20.10	
09/15	15:30	-5.42	20.10	
09/15	15:45	-5.42	20.10	
09/15	16:00	-5.43	19.44	
09/15	16:15	-5.42	20.10	
09/15	16:30	-5.42	20.10	
09/15	16:45	-5.42	20.10	
09/15	17:00	-5.42	20.10	
09/15	17:15	-5.41	20.77	
09/15	17:30	-5.44	18.78	
09/15	17:45	-5.42	20.10	
09/15	18:00	-5.44	18.78	
09/15	18:15	-5.43	19.44	
09/15	18:30	-5.43	19.44	
09/15	18:45	-5.43	19.44	
09/15	19:00	-5.42	20.10	
09/15	19:15	-5.42	20.10	
09/15	19:30	-5.42	20.10	
09/15	19:45	-5.44	18.78	
09/15	20:00	-5.42	20.10	
09/15	20:15	-5.42	20.10	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/15	20:30	-5.42	20.10	
09/15	20:45	-5.42	20.10	
09/15	21:00	-5.41	20.77	
09/15	21:15	-5.39	22.13	
09/15	21:30	-5.39	22.13	
09/15	21:45	-5.39	22.13	
09/15	22:00	-5.40	21.45	
09/15	22:15	-5.39	22.13	
09/15	22:30	-5.38	22.83	
09/15	22:45	-5.39	22.13	
09/15	23:00	-5.38	22.83	
09/15	23:15	-5.37	23.53	
09/15	23:30	-5.40	21.45	
09/15	23:45	-5.38	22.83	20
09/16	00:00	-5.40	21.45	
09/16	00:15	-5.37	23.53	
09/16	00:30	-5.37	23.53	
09/16	00:45	-5.37	23.53	
09/16	01:00	-5.37	23.53	
09/16	01:15	-5.38	22.83	
09/16	01:30	-5.37	23.53	
09/16	01:45	-5.38	22.83	
09/16	02:00	-5.38	22.83	
09/16	02:15	-5.38	22.83	
09/16	02:30	-5.38	22.83	
09/16	02:45	-5.38	22.83	
09/16	03:00	-5.38	22.83	
09/16	03:15	-5.39	22.13	
09/16	03:30	-5.39	22.13	
09/16	03:45	-5.38	22.83	
09/16	04:00	-5.39	22.13	
09/16	04:15	-5.37	23.53	
09/16	04:30	-5.38	22.83	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/16	04:45	-5.38	22.83	
09/16	05:00	-5.38	22.83	
09/16	05:15	-5.38	22.83	
09/16	05:30	-5.38	22.83	
09/16	05:45	-5.38	22.83	
09/16	06:00	-5.40	21.45	
09/16	06:15	-5.38	22.83	
09/16	06:30	-5.40	21.45	
09/16	06:45	-5.37	23.53	
09/16	07:00	-5.38	22.83	
09/16	07:15	-5.37	23.53	
09/16	07:30	-5.38	22.83	
09/16	07:45	-5.37	23.53	
09/16	08:00	-5.37	23.53	
09/16	08:15	-5.36	24.24	
09/16	08:30	-5.37	23.53	
09/16	08:45	-5.39	22.13	
09/16	09:00	-5.38	22.83	
09/16	09:15	-5.37	23.53	
09/16	09:30	-5.40	21.45	
09/16	09:45	-5.39	22.13	
09/16	10:00	-5.38	22.83	
09/16	10:15	-5.37	23.53	
09/16	10:30	-5.38	22.83	
09/16	10:45	-5.37	23.53	
09/16	11:00	-5.37	23.53	
09/16	11:15	-5.38	22.83	
09/16	11:30	-5.38	22.83	
09/16	11:45	-5.37	23.53	
09/16	12:00	-5.38	22.83	
09/16	12:15	-5.37	23.53	
09/16	12:30	-5.39	22.13	
09/16	12:45	-5.38	22.83	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/16	13:00	-5.39	22.13	
09/16	13:15	-5.37	23.53	
09/16	13:30	-5.38	22.83	
09/16	13:45	-5.38	22.83	
09/16	14:00	-5.39	22.13	
09/16	14:15	-5.39	22.13	
09/16	14:30	-5.39	22.13	
09/16	14:45	-5.39	22.13	
09/16	15:00	-5.40	21.45	
09/16	15:15	-5.38	22.83	
09/16	15:30	-5.39	22.13	
09/16	15:45	-5.38	22.83	
09/16	16:00	-5.38	22.83	
09/16	16:15	-5.37	23.53	
09/16	16:30	-5.39	22.13	
09/16	16:45	-5.39	22.13	
09/16	17:00	-5.38	22.83	
09/16	17:15	-5.38	22.83	
09/16	17:30	-5.39	22.13	
09/16	17:45	-5.39	22.13	
09/16	18:00	-5.37	23.53	
09/16	18:15	-5.40	21.45	
09/16	18:30	-5.38	22.83	
09/16	18:45	-5.38	22.83	
09/16	19:00	-5.39	22.13	
09/16	19:15	-5.39	22.13	
09/16	19:30	-5.38	22.83	
09/16	19:45	-5.39	22.13	
09/16	20:00	-5.41	20.77	
09/16	20:15	-5.38	22.83	
09/16	20:30	-5.38	22.83	
09/16	20:45	-5.37	23.53	
09/16	21:00	-5.35	24.96	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/16	21:15	-5.35	24.96	
09/16	21:30	-5.35	24.96	
09/16	21:45	-5.36	24.24	
09/16	22:00	-5.34	25.68	
09/16	22:15	-5.35	24.96	
09/16	22:30	-5.35	24.96	
09/16	22:45	-5.33	26.41	
09/16	23:00	-5.35	24.96	
09/16	23:15	-5.32	27.16	
09/16	23:30	-5.36	24.24	
09/16	23:45	-5.34	25.68	23
09/17	00:00	-5.34	25.68	
09/17	00:15	-5.27	30.97	
09/17	00:30	-5.28	30.19	
09/17	00:45	-5.27	30.97	
09/17	01:00	-5.27	30.97	
09/17	01:15	-5.27	30.97	
09/17	01:30	-5.28	30.19	
09/17	01:45	-5.28	30.19	
09/17	02:00	-5.27	30.97	
09/17	02:15	-5.26	31.76	
09/17	02:30	-5.27	30.97	
09/17	02:45	-5.28	30.19	
09/17	03:00	-5.28	30.19	
09/17	03:15	-5.28	30.19	
09/17	03:30	-5.28	30.19	
09/17	03:45	-5.27	30.97	
09/17	04:00	-5.28	30.19	
09/17	04:15	-5.27	30.97	
09/17	04:30	-5.29	29.42	
09/17	04:45	-5.28	30.19	
09/17	05:00	-5.28	30.19	
09/17	05:15	-5.28	30.19	



DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/17	05:30	-5.28	30.19	
09/17	05:45	-5.29	29.42	
09/17	06:00	-5.29	29.42	
09/17	06:15	-5.28	30.19	
09/17	06:30	-5.29	29.42	
09/17	06:45	-5.29	29.42	
09/17	07:00	-5.29	29.42	
09/17	07:15	-5.29	29.42	
09/17	07:30	-5.28	30.19	
09/17	07:45	-5.28	30.19	
09/17	08:00	-5.29	29.42	
09/17	08:15	-5.29	29.42	
09/17	08:30	-5.29	29.42	
09/17	08:45	-5.29	29.42	
09/17	09:00	-5.28	30.19	
09/17	09:15	-5.29	29.42	
09/17	09:30	-5.30	28.66	
09/17	09:45	-5.29	29.42	
09/17	10:00	-5.28	30.19	
09/17	10:15	-5.28	30.19	
09/17	10:30	-5.27	30.97	
09/17	10:45	-5.27	30.97	
09/17	11:00	-5.28	30.19	
09/17	11:15	-5.29	29.42	
09/17	11:30	-5.28	30.19	
09/17	11:45	-5.28	30.19	
09/17	12:00	-5.29	29.42	
09/17	12:15	-5.29	29.42	
09/17	12:30	-5.30	28.66	
09/17	12:45	-5.29	29.42	
09/17	13:00	-5.30	28.66	
09/17	13:15	-5.29	29.42	
09/17	13:30	-5.30	28.66	
09/17	13:45	-5.30	28.66	
09/17	14:00	-5.30	28.66	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/17	14:15	-5.30	28.66	
09/17	14:30	-5.29	29.42	
09/17	14:45	-5.30	28.66	
09/17	15:00	-5.29	29.42	
09/17	15:15	-5.31	27.90	
09/17	15:30	-5.31	27.90	
09/17	15:45	-5.30	28.66	
09/17	16:00	-5.28	30.19	
09/17	16:15	-5.29	29.42	
09/17	16:30	-5.30	28.66	
09/17	16:45	-5.29	29.42	
09/17	17:00	-5.29	29.42	
09/17	17:15	-5.29	29.42	
09/17	17:30	-5.29	29.42	
09/17	17:45	-5.29	29.42	
09/17	18:00	-5.29	29.42	
09/17	18:15	-5.29	29.42	
09/17	18:30	-5.29	29.42	
09/17	18:45	-5.30	28.66	
09/17	19:00	-5.29	29.42	
09/17	19:15	-5.30	28.66	
09/17	19:30	-5.29	29.42	
09/17	19:45	-5.29	29.42	
09/17	20:00	-5.30	28.66	
09/17	20:15	-5.29	29.42	
09/17	20:30	-5.30	28.66	
09/17	20:45	-5.31	27.90	
09/17	21:00	-5.33	26.41	
09/17	21:15	-5.35	24.96	
09/17	21:30	-5.39	22.13	
09/17	21:45	-5.42	20.10	
09/17	22:00	-5.43	19.44	
09/17	22:15	-5.46	17.50	
09/17	22:30	-5.47	16.87	
09/17	22:45	-5.49	15.64	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/17	23:00	-5.50	15.04	
09/17	23:15	-5.53	13.29	
09/17	23:30	-5.55	12.16	
09/17	23:45	-5.56	11.62	28
09/18	00:00	-5.57	11.08	
09/18	00:15	-5.59	10.03	
09/18	00:30	-5.60	9.52	
09/18	00:45	-5.62	8.53	
09/18	01:00	-5.63	8.05	
09/18	01:15	-5.64	7.58	
09/18	01:30	-5.65	7.12	
09/18	01:45	-5.66	6.68	
09/18	02:00	-5.68	5.81	
09/18	02:15	-5.68	5.81	
09/18	02:30	-5.69	5.40	
09/18	02:45	-5.70	5.00	
09/18	03:00	-5.71	4.60	
09/18	03:15	-5.72	4.23	
09/18	03:30	-5.73	3.86	
09/18	03:45	-5.74	3.50	
09/18	04:00	-5.74	3.50	
09/18	04:15	-5.75	3.16	
09/18	04:30	-5.76	2.83	
09/18	04:45	-5.77	2.52	
09/18	05:00	-5.77	2.52	
09/18	05:15	-5.79	1.93	
09/18	05:30	-5.79	1.93	
09/18	05:45	-5.80	1.66	
09/18	06:00	-5.80	1.66	
09/18	06:15	-5.81	1.40	
09/18	06:30	-5.81	1.40	
09/18	06:45	-5.82	1.16	
09/18	07:00	-5.82	1.16	
09/18	07:15	-5.82	1.16	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/18	07:30	-5.83	0.94	
09/18	07:45	-5.83	0.94	
09/18	08:00	-5.84	0.74	
09/18	08:15	-5.84	0.74	
09/18	08:30	-5.85	0.55	
09/18	08:45	-5.85	0.55	
09/18	09:00	-5.86	0.39	
09/18	09:15	-5.86	0.39	
09/18	09:30	-5.86	0.39	
09/18	09:45	-5.87	0.24	
09/18	10:00	-5.87	0.24	
09/18	10:15	-5.88	0.13	
09/18	10:30	-5.88	0.13	
09/18	10:45	-5.88	0.13	
09/18	11:00	-5.89	0.04	
09/18	11:15	-5.89	0.04	
09/18	11:30	-5.89	0.04	
09/18	11:45	-5.90	0.00	
09/18	12:00	-5.90	0.00	
09/18	12:15	-5.90	0.00	
09/18	12:30	-5.90	0.00	
09/18	12:45	-5.90	0.00	
09/18	13:00	-5.90	0.00	
09/18	13:15	-5.90	0.00	
09/18	13:30	-5.90	0.00	
09/18	13:45	-5.90	0.00	
09/18	14:00	-5.90	0.00	
09/18	14:15	-5.90	0.00	
09/18	14:30	-5.90	0.00	
09/18	14:45	-5.90	0.00	
09/18	15:00	-5.90	0.00	
09/18	15:15	-5.90	0.00	
09/18	15:30	-5.90	0.00	
09/18	15:45	-5.90	0.00	
09/18	16:00	-5.90	0.00	

DATE	TIME	STAGE	COMPUTED	COMPUTED
		(datalogger)	DISCHARGE	MEAN DAILY
		(ft)	(cfs)	DISCHARGE
				(cfs)
09/18	16:15	-5.90	0.00	
09/18	16:30	-5.90	0.00	
09/18	16:45	-5.90	0.00	
09/18	17:00	-5.90	0.00	
09/18	17:15	-5.90	0.00	
09/18	17:30	-5.90	0.00	
09/18	17:45	-5.90	0.00	
09/18	18:00	-5.90	0.00	
09/18	18:15	-5.90	0.00	
09/18	18:30	-5.90	0.00	
09/18	18:45	-5.90	0.00	
09/18	19:00	-5.90	0.00	
09/18	19:15	-5.90	0.00	
09/18	19:30	-5.90	0.00	
09/18	19:45	-5.90	0.00	
09/18	20:00	-5.90	0.00	
09/18	20:15	-5.90	0.00	
09/18	20:30	-5.90	0.00	
09/18	20:45	-5.90	0.00	
09/18	21:00	-5.90	0.00	
09/18	21:15	-5.90	0.00	
09/18	21:30	-5.90	0.00	
09/18	21:45	-5.90	0.00	
09/18	22:00	-5.90	0.00	
09/18	22:15	-5.90	0.00	
09/18	22:30	-5.90	0.00	
09/18	22:45	-5.90	0.00	
09/18	23:00	-5.90	0.00	
09/18	23:15	-5.90	0.00	
09/18	23:30	-5.90	0.00	
09/18	23:45	-5.90	0.00	1.5

\*Data maintenance included a new calibration equation on 09/08 and 09/09.





## **APPENDIX D**



**RATING TABLE**  
**STAGE (ft) vs. DISCHARGE (cfs)**  
**FOR**  
**KOLOB CREEK A CONFLUENCE**  
**WITH NORTH FORK OF THE VIRGIN RIVER**

STAGE (ft)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
4.00	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*
4.10	0.00*	0.04*	0.13*	0.24*	0.39*	0.55*	0.74*	0.94*	1.16	1.40
4.20	1.66	1.93	2.22	2.52	2.83	3.16	3.50	3.86	4.23	4.61
4.30	5.00	5.40	5.81	6.24	6.68	7.12	7.58	8.05	8.53	9.02
4.40	9.52	10.03	10.55	11.08	11.62	12.16	12.72	13.29	13.86	14.45
4.50	15.04	15.64	16.26	16.88	17.50	18.14	18.79	19.44	20.10	20.77
4.60	21.45	22.13	22.83	23.53	24.24	24.96	25.68	26.42	27.16	27.91
4.70	28.66	29.42	30.19*	30.97*	31.76*	32.55*	33.35*	34.16*	34.97*	35.79*
4.80	36.62*	37.46*	38.30*	39.15*	40.00*	40.87*	41.74*	42.61*	43.50*	44.39*
4.90	45.28*	46.19*	47.10*	48.01*	48.94*	49.87*	50.80*	51.74*	52.69*	53.65*
5.00	54.61*	55.58*	56.55*	57.53*	58.52*	59.51*	60.51*	61.52*	62.53*	63.55*

\* STAGE OUTSIDE RANGE OF RATING DATA





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As the nation's principal conservation agency, the Department of the Interior has the responsibility for most of our nationally owned public lands and natural and cultural resources. This includes fostering wise use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people. The Department also promotes the goals of the Take Pride in America campaign by encouraging stewardship and citizen responsibility for the public lands and promoting citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

